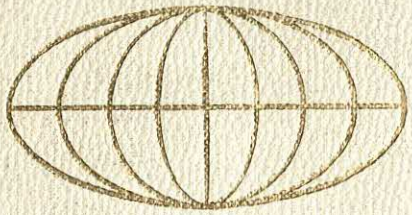

THE WORLD UNIVERSITY ENCYCLOPEDIA

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The
WORLD UNIVERSITY ENCYCLOPEDIA
Unabridged

Volume 12

VERMEER–ZYGOTE

AN ILLUSTRATED TREASURY OF KNOWLEDGE

Publishers Company, Inc.
Washington, D.C.

Key to Pronunciation

VOWELS

ă (short), as in *hat, cat.*
ā (long), as in *ale, hate.*
ä (Italian), as in *car, mar.*
ȧ (short Italian), as in *fast, class.*
ạ (broad), as in *all, fall.*
â (circumflex), as in *care, snare.*
ạ or a̤ (short obscure), as in *final, spinal.*
ȃ (long obscure), as in *surface.*
ae, as in *Caesar,* = ē.

ĕ (short), as in *net, met.*
ē (long), as in *me, eve.*
ê (circumflex = â), as in *there.*
ẽ (tilde), as in *her.*
ẹ or ȩ (short obscure), as in *patent.*
ȇ (long obscure), as in *delay.*
ė = ĭ, as in *pretty.*

ĭ (short), as in *hit, bit.*
ī (long), as in *kite, mite.*
ĩ (tilde), as in *sir.*
i (short obscure), as in *habit.*
ȋ (long obscure), as in *idea.*

ŏ (short), as in *pop, hop.*
ō (long), as in *cone, bone.*
ô (circumflex = ạ), as in *for.*
ȏ (long obscure), as in *hero.*
ŏŏ (short), as in *book, brook.*
ōō (long), as in *moon, spoon.*
ọ = û, as in *word.*
ȯ = ŭ, as in *son.*
oe, as in *Phoebe,* = ē.

ŭ (short), as in *rut, cut.*
ū (long), as in *muse, fuse.*
û (circumflex), as in *turn, urn.*
ȗ (long obscure), as in *unite.*

w is a vowel only after a vowel, when it forms the second element of certain diphthongs, as in *few, how.*

y̆ (short) = ĭ, as in *hymn.*
ȳ (long) = ī, as in *by, cry.*

CONSONANTS

ϵ (hard) = k, as in *cat, cape.*
ç (cedilla) = s, as in *cell, façade.*
ḡ (hard), as in *dog, gave.*
ġ (soft), as in *gem, gentle.*
ķ for the German ch, as in *ich, Bach* (bäk); also = ϵ

ü for the German ü, as in *Blücher, Grünberg.*
ö for the German ö, as in *Göttingen.*
n̲ for the French n, as in *bon, Bréton* (*brâ-tôn̲′*).
th (soft), as in *path.*
TH (hard), as in *the, father.*
ñ for the sound of ny, as in *canyon.*

C.E.R.T.
Date
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Courtesy Metropolitan Museum of Art, N. Y.

YOUNG WOMAN WITH A WATER JUG
PAINTING BY JAN VERMEER, ABOUT 1659

Vermeer (*vĕr-mēr′*), JAN, also known as VAN DER MEER VAN DELFT, painter, baptized at Delft, Holland, Oct. 31, 1632; died there, Dec. 15, 1675. He studied with Carel Fabritius, then entered the painters' guild of Delft. Although he was little known for two centuries after his death, this genre and landscape painter, who excelled in his handling of color, came to be regarded as one of the great Dutch masters. Excellent craftsmanship and an almost modern technique, combined with superb color harmony and light, characterize his paintings. Although dealing essentially with the same topics as other great artists in Holland of his time, his individual mastery proves itself by the specific mood which permeates his interiors or landscapes, such as the "View of Delft" (*ca.* 1658). Paintings such as "The Milkmaid" (*ca.* 1658), "Young Girl in Blue" (*ca.* 1662), and "Young Girl with a Flute" (*ca.* 1664) reveal a special intensity of feeling, expressed by dynamic condensation of color and light. His paintings, of which there are relatively few, are rarely dated; only some 35 paintings have been authenticated.

Vermejo (*bĕr-mĕ′hō̂*) or BERMEJO, a river of Argentina, rising in the Andean highlands near Argentina's Bolivian frontier and flowing toward the southeast into the Paraguay River shortly before it joins the Paraná River. First explored in 1721, the Vermejo is unsuitable for navigation because of its swift currents, quicksand, and shoals. It is *ca.* 1,000 m. long, and its chief tributary is the San Francisco River. The Vermejo is sometimes referred to as the Teuco River.

Vermes (*vĕr′mēz*) or WORMS. See *Worms.*

Vermeylen (*vĕr-mī′lẹn*), AUGUST, author, born in Brussels, Belgium, 1872; died in 1945. Professor of art at the Univ. of Brussels and the State Univ. of Ghent, he stimulated a revival of Flemish literature and was a leader of the Neoromantic school. His writings include "Critique of the Flemish Movement" (1905) and the novel "The Wandering Jew" (1906).

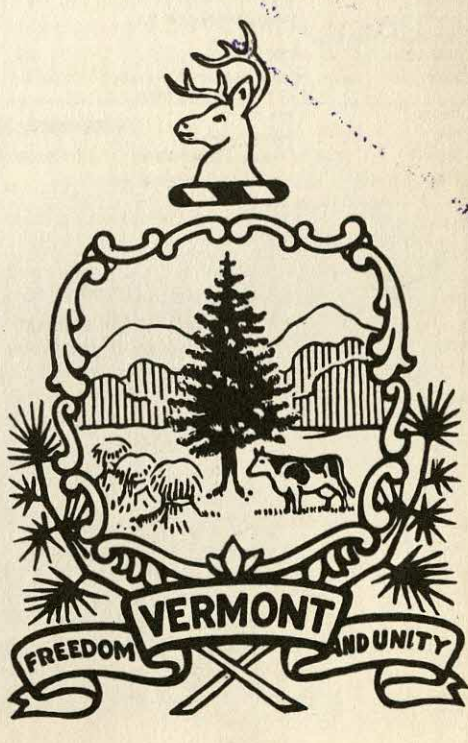
Vermicelli (*vĕr-mĭ-sĕl′ĭ*). See *Macaroni.*

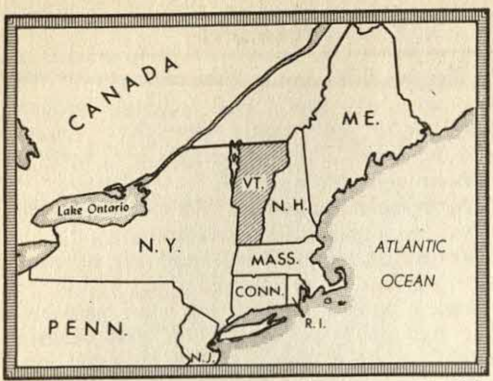
Vermiform Appendix (*vêr′mĭ-fôrm ạ-pĕn′dĭks*). See *Appendicitis; Intestines.*

Vermilion (*vĕr-mĭl′yŭn*), a brilliant and durable pigment of a vivid red color. It can be obtained from a mineral ore called cinnabar, but it is usually prepared synthetically. Known as red sulfide of mercury, it is produced artificially by grinding a mixture of mercury and sulfur for several hours and then treating the black product with potassium hydroxide until the desired color is obtained. Because of its resistant pigments, it is used in paints to protect iron and steel.

Vermont (*vĕr-mŏnt′*), a state in the New England section of the U.S., known principally for its scenery, its marble and granite, its sugar-maple products, and the individualism of its people. Vermont is still largely an agricultural state, although since 1950 manufacturing has become increasingly important.

Vermont is bounded on the N. by the Canadian Province of Quebec, on the E. by New Hampshire, on the S. by Massachusetts, and on the W. by New York. Its entire eastern boundary is formed by the Connecticut River and about half its western boundary by Lake Champlain.





It ranks 43rd in size among the states and 48th in population, according to the 1958 estimates of civilian population (Alaska, Hawaii, and the District of Columbia included in both rankings). The state's name, from the French words *vert,* "green," and *mont,* "mountain" (for its extensive evergreen forests), may have been first applied by the explorer Samuel de Champlain, in 1609. Its nickname is the "Green Mountain State."

Location	Between 71°28′ and 73°26′ W. long. and 42°44′ and 45°1′ N. lat.
Area	9,609 sq. m.
Land	9,278 sq. m.
Inland water	331 sq. m.
Greatest extent:	
North to south	156 m.
East to west	89 m.
Population (1950)	377,747
Capital city	Montpelier
Highest point	Mt. Mansfield (4,393 ft.)
Lowest point	Lake Champlain (95 ft.)
Admitted to the Union (14th state)	1791
Song	"Hail to Vermont," words and music by Josephine Hovey Perry
Flower	Red clover
Bird	Hermit thrush
Motto	"Freedom and Unity"
Flag	See color plate in Vol. XI

GEOGRAPHY

Vermont, the only New England state with no coast line, is wedge-shaped, about one-third as wide in the south as in the north. Its dominant physical feature is the range of the Green Mts., which virtually bisects the state from north to south. The western half of the state falls into two main regions. The Champlain Valley area parallels Lake Champlain, which extends *ca.* 100 m. along the northwestern border. This is met near Brandon and Sudbury by the Taconic Mt. range, which stretches southward to Massachusetts, making up much of Vermont's western boundary. More than half of Lake Champlain lies within Vermont (the remainder, in New York and Quebec). In the northwestern section are the Red Sandrock Hills, known for red building stone and dolomite deposits, extending from Addison to St. Albans. Among the highest peaks on the western side of the Green Mts. are Mt. Mansfield (4,393 ft.), accessible by motor road and chair-lift; Mt. Ellen (4,135 ft.); and Camel's Hump (4,083 ft.).

East of the Green Mts. lies the long (*ca.* 180 m.) and fertile Connecticut Valley region, where the Connecticut River forms the boundary with New Hampshire. From somewhat below the middle of the state northward to the Canadian border run the Granite Hills. The highest peak in this range is Millstone Hill (1,700 ft.), at Barre. Also in this eastern part of the state are several individual peaks, related to the Granite Hills system and typically oval or cone-shaped, such as Mt. Ascutney (3,144 ft.) in the southeast and Monadnock Mt. (3,140 ft.) in the northeast.

Most of the state's rivers drain either the eastern slopes of the Green Mts. into the Connecticut River or the western slopes into Lake Champlain. In the northern section of the Green Mts., the Misisquoi, Lamoille, and Winooski rivers rise in the east but break through the range to empty into Lake Champlain. Otter Creek, one of Vermont's largest rivers and one of the few entirely within the state, flows northward and empties into Lake Champlain. The southwestern corner of the state is drained by the Batten Kill and Hoosic rivers, which flow into the Hudson River. Vermont has over 100 lakes and ponds. Among the most notable are Lake Memphremagog (most of which lies in Quebec), Lakes Bomoseen and St. Catherine near the central western boundary, and Sterling Pond, at an altitude of 3,200 ft., near Stowe.

A 260-m. footpath called the Long Trail runs from Blackinton, Mass., to the Canadian border, along the central ridge of the Green Mts. Certain points along it are accessible by rail and highway, and shelters and lodges are provided at frequent intervals. At Montpelier, the capital, are numerous historical exhibits. The birthplace of President Calvin Coolidge stands at Plymouth, and near Brattleboro is a bungalow built by the famous English writer Rudyard Kipling for his wife, a native of Vermont. In Windsor is the Old Constitution House, where the state's first constitution was written and where the general assembly met before the removal of the capital to Montpelier. At Proctor is a large public exhibit of marble and granite. Bennington has numerous historic landmarks and 18th-century houses, the campus of Bennington Coll., and the 306-ft. Battle Monument commemorating an American victory over British-Hessian troops in 1777. The state has many summer resorts, especially in Grand Isle County, the Lake Champlain region, and other lake areas. In recent decades, skiing has become a leading attraction; the state has more than 30 ski developments and the skiing season runs from mid-December into April.

Climate: The climate of Vermont is fairly uniform. Summers are short, with temperatures rarely rising above *ca.* 90° F. and with cool nights. The winters are long, and cold enough so that snows remain on the ground for extended periods; temperatures may drop as low as —30° F. Rainfall ranges from an annual average of 32 in. at lower altitudes to *ca.* 48-50 in. in the mountains. The annual snowfall ranges from 5.5 ft. in the lower valleys to 8-9 ft. in the mountains.

Normal temperature, Burlington	
January	17.9° F.
July	70.4° F.
Annual mean	44.5° F.
Latest frost, Burlington	May 23
Earliest frost, Burlington	Sept. 13
Precipitation, Burlington	
January	1.89 in.
July	3.75 in.
Annual	32.22 in.
Average growing season, Burlington	113 days

NATURAL RESOURCES

Although Vermont is not primarily a mining state, it ranks first among the states in the production of marble, granite, and asbestos; second in slate; and fourth in talc and copper. The largest mineral deposits lie in the eastern slopes of the Green Mts. Granite quarrying is centered largely around Barre, marble around Rutland.

ANNUAL STATE EVENTS

Stowe Cup Races	January; Stowe; ski events
Vermont Farm Show	February; Barre; farm-machinery exhibits
Rutland-Pico Winter Carnival	Mid-February; Pico Peak, near Rutland; ski events
New England Kandahar Ski Event	Mid-March; Mad River Glen, near Waitsfield
Sportsmen's Show	April; Barre; exhibits of fish and wildlife, hunting equipment, and conservation practices
Tulip Festival	May; Hardwick
Vermont County Dance Festival	May 2; Barre
Lumberjack Roundup	Mid-August; Lake Dunmore; canoe races, bait and fly casting, chopping contests, birling
Champlain Valley Fair	Late August; Essex Junction; agricultural show, horse races
Rutland Fair	Early September; Rutland; agricultural show, horse races
Fall Foliage Festival	Early October; Barnet, Danville, Peacham; foliage tours, raccoon hunt

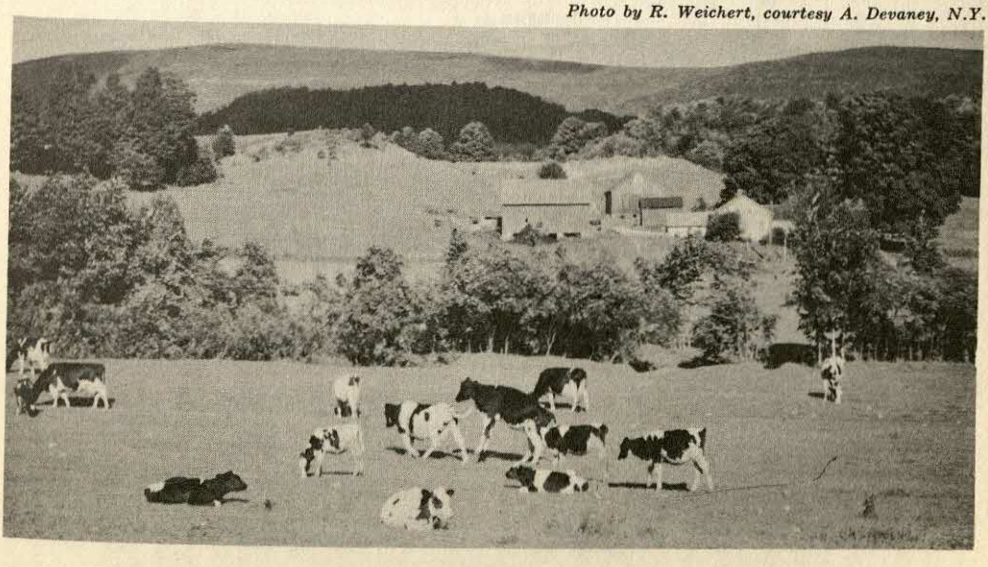
Many of the state's streams have been harnessed to produce hydroelectric power. The lakes and rivers support many game fish such as trout, bass, and salmon.

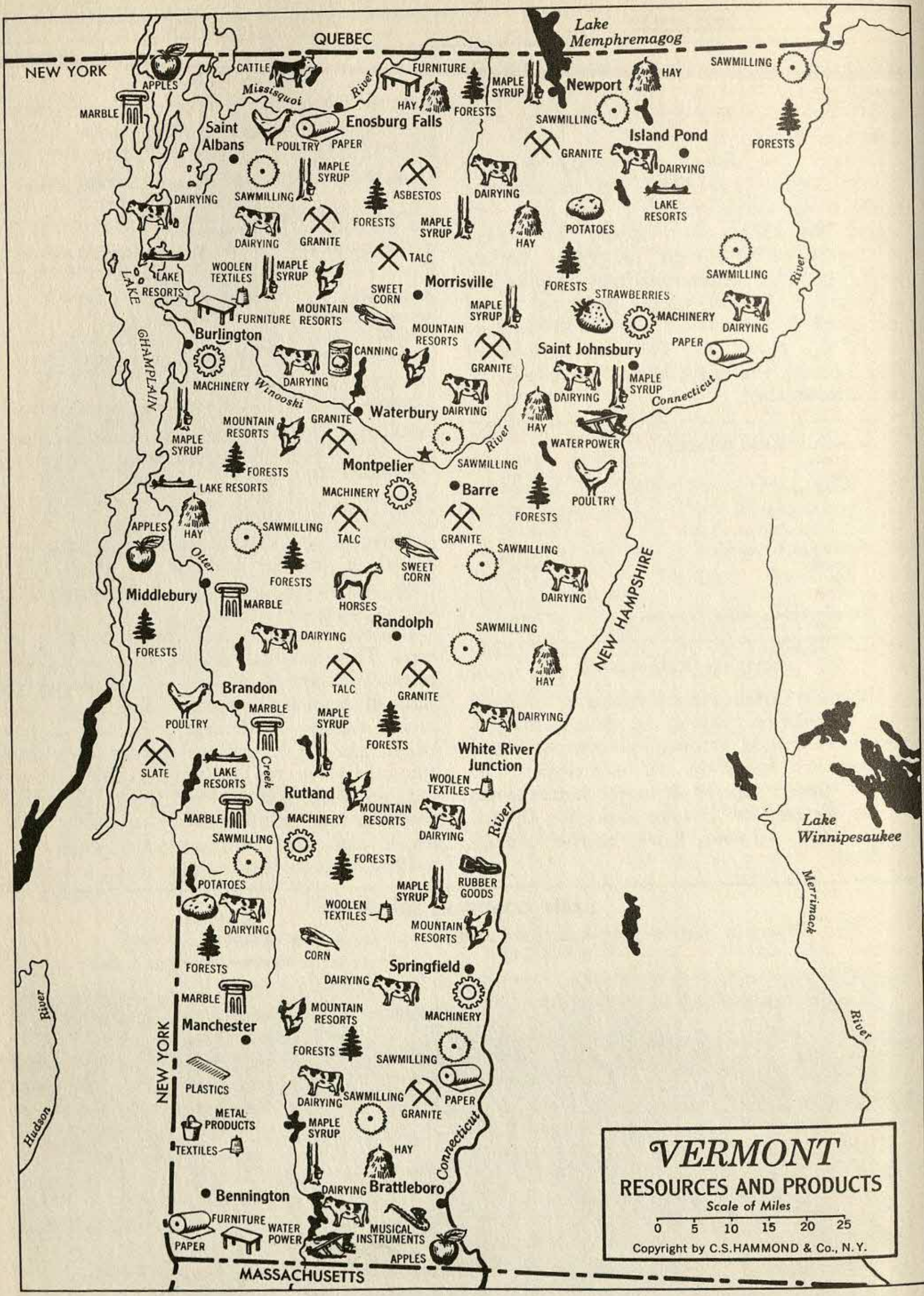
Commercial forest land covers *ca.* 3,800,000 acres. There are also 629,004 acres of national forests and some 78,000 acres of state and 16,000 acres of municipally owned forest lands. Sawtimber volume is estimated at *ca.* 8,547,000,000 bd. ft. and the annual cut averages more than 280,000,000 bd. ft. The most valuable timber trees are white pine and red spruce. Vermont's abundant sugar maples provide sap for the making of maple sugar and maple syrup, and their brilliant autumn foliage draws many tourists.

DAIRY FARM NEAR SHAFTSBURY

Dairy products are one of the most profitable sources of farm income in Vermont

Photo by R. Weichert, courtesy A. Devaney, N.Y.





The state in 1957 was divided into 13 soil-conservation districts covering 5,931,000 acres, financed jointly by local, state, and Federal agencies. After the disastrous flood of 1937, Vermont, with Federal aid, began a dam-building program; some of the major dams erected were those on the Winooski and the Ompompanoosuc rivers. The state's highest dam is the Davis Bridge Dam, on the Deerfield River, which impounds the Whitingham Reservoir.

Vermont's Economy

Vermont had long been primarily an agricultural and dairying state, but by 1950 manufacturing had relegated agriculture to second place. In 1950 manufacturing was the largest employer, engaging about 25 per cent of the labor force. The principal manufactures are nonelectrical machinery; machine tools; foodstuffs; stone, clay, and glass products; pulp and paper products; and textiles (principally woolen) and textile products. The value added by manufacture in 1956 was $248,000,000.

Agriculture was the second-largest employer in 1950, with 20 per cent of the state's employed workers. In 1954 there were 15,999 farms. Farm acreage totaled 3,318,000, with 207.6 acres the average per farm. Because of hilly terrain and frequently stony soil, the land is better adapted for pasturage than for field crops. The most profitable phases of agriculture are dairying and dairy products (1954 value, $64,327,000), the production of poultry and eggs, and livestock raising. The principal crop in 1954 was hay. The most distinctive agricultural enterprise is the production of maple syrup and maple sugar; some 40 per cent of the nation's output of these comes from Vermont. The southern part of the state has many productive apple orchards. The 1957 cash income from crops, livestock, and government payments was $113,875,000.

Wholesale and retail trade together formed the third-largest employment sector in 1950, accounting for almost 16 per cent of the employed workers. Vermont's total labor force in 1950 was 137,264.

Vermont contributed less than 1 per cent of total U.S. mineral production in 1956, ranking 43rd among the states; its mineral output for that year was valued at $23,131,000.

Tourism, including skiing and winter sports, is becoming a major factor in the state's economy; estimates place the annual income from these sources at *ca.* $40,000,000.

TRANSPORTATION AND COMMUNICATION

Vermont is served by several railroads. The first railroad to operate in the state was the Vermont Central R.R. (1848), now the Central Vermont Ry. Other railroads include the Delaware & Hudson R.R., the Maine Central R.R., and the Canadian National Ry. Railroad mileage in 1957 was 817. In 1957 the state had 13,793 m. of roads, of which 11,240 were surfaced. The principal cities have airfields. In 1957 the state had 13 radio stations and one television station. The first newspaper published in the state was the *Vermont Gazette, or, The Green Mountain Post Boy* (1781), at Westminster. The oldest extant newspaper in the state is the *Vermont Journal and Advertiser,* a weekly founded at Windsor in 1783. Among today's leading newspapers are the Burlington *Free Press* and the Rutland *Herald.*

POPULATION

Vermont has 14 counties. The state's 1950 urban population comprised 36.4 per cent of the total population; the rural population, 63.6 per cent. Between 1940 and 1950, the urban population rose 11.7 per cent over that of 1940; the rural population rose by 1.8 per cent. About 45 per cent of the urban population lived in the three urbanized areas of Burlington, Rutland, and Barre. Vermont's population was estimated at 372,000 on July 1, 1958. In 1950 white persons numbered 377,188; of these, 348,435 were native born and 28,753 were foreign born (mostly Canadian). Nonwhite persons totaled 559; of these, 443 were Negroes, with the remainder including Indians, Japanese, and Chinese. Population density in 1950 averaged 40.7 per sq. m.

The major religious faiths, in order of size, in 1950 were the Roman Catholic and the Protestant, with a very small Jewish group. The predominant Protestant bodies were the Congregational Christian Churches, The Methodist Church, the Protestant Episcopal Church, and the American Baptist Convention.

Chief Cities: Burlington, on Lake Champlain in northwestern Vermont, is the largest city, an industrial and trading center, and the seat of the Univ. of Vermont.

Rutland, in west central Vermont, the second largest city, is noted for its marble quarries, scale factories, and nearby summer and winter tourist attractions.

Barre, in north central Vermont, the third-largest city, is one of the nation's leading granite-quarrying centers.

Brattleboro, in southeastern Vermont, the fourth-largest urban place, is known for textile manufacturing and as a winter-sports center.

Montpelier, the state capital, in north central Vermont, is a manufacturing city and the trade center of an agricultural region.

Famous Men and Women: Allen, Ethan (1738-89), Connecticut-born leader of the Green Mountain Boys; a commander in the Revolutionary War.

Arthur, Chester Alan (1830-86), 21st President of the U.S. (1881-85).

Austin, Warren Robinson (1877-), U.S. Senator (1932-46), chief of U.S. delegation to the U.N. (1946-52).

Bailey, Consuelo Northrop (1899-), first woman to be elected lieutenant governor of Vermont (1954).

Chittenden, Thomas (1730-97), Connecticut-born first governor of Vermont (1778-89, 1790-97), co-author of the proclamation declaring Vermont an independent state.

Clark, Charles Edgar (1834-1922), admiral known as "Clark of the *Oregon*" for a naval exploit at Santiago, Cuba (1898).

Coolidge, Calvin (1872-1933), 30th President of the U.S. (1923-29).

Davenport, Thomas (1802-51), inventor of the electric motor (1834) and of the first working model of an electric tram car (1836).

Deere, John (1804-86), inventor of the steel plow.

Dewey, George (1837-1917), admiral, victor in the battle of Manila Bay (1898).

Dewey, John (1859-1952), educator, philosopher, exponent of progressive education.

Fisher, Dorothy Canfield (1879-1958), Kansas-born author, many of whose novels portray Vermont backgrounds.

Morrill, Justin Smith (1810-98), U.S. Representative (1855-67), U.S. Senator (1867-98), author of the Morrill Act which set up "land-grant" colleges.

EDUCATION

Education is free and compulsory for children between seven and 16. The state's public-school system was established in 1777, when Vermont became the first state to make constitutional provision for a complete state system of education. The state's first public high school was opened in 1841, at Brattleboro. In 1958 public-school enrollment totaled 71,100. The state-supported institutions of higher learning include the Univ. of Vermont, established at Burlington in 1791 (combined with the state agricultural college in 1865), and three teachers colleges, at Castleton, Johnson, and Lyndon Center. The leading private or denominational colleges include Middlebury Coll., Middlebury; Norwich Univ., Northfield; Bennington Coll., Bennington; St. Michael's Coll., Winooski Park; and Trinity Coll., Burlington.

Cultural institutions include museums and art galleries at Bennington, Burlington, Middlebury, Montpelier, and St. Johnsbury. The museum at Bennington is noted for its collection of military relics and historical documents and of early American glass, furniture, pottery, and utensils; its art collection includes American and foreign masters. At Weston, the Vermont Guild of Old-Time Crafts maintains a working museum of early American industries such as milling, weaving, and woodworking.

GOVERNMENT

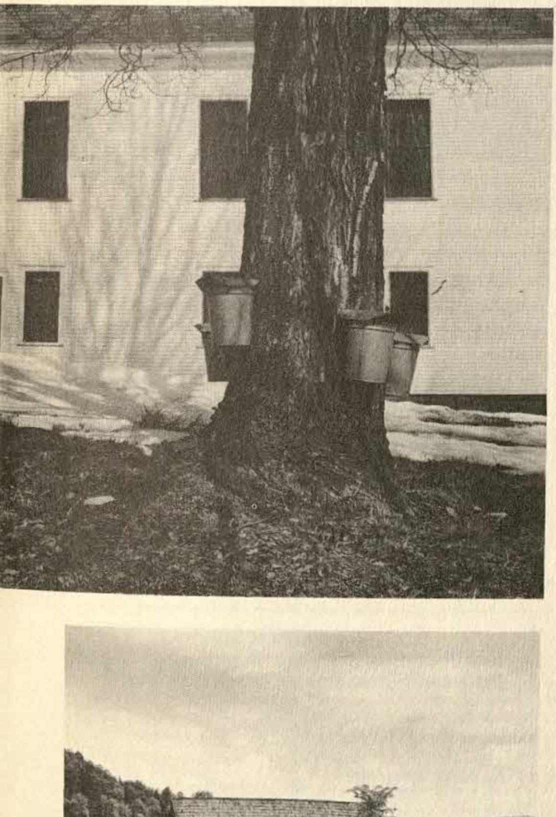
Vermont is governed under provisions of a constitution adopted in 1777 and several times amended. The constitution gives executive authority to a governor, lieutenant governor, secretary of state, treasurer, auditor, and attorney general, all elected for two-year terms. The elected legislature consists of a senate of 30 members and a house of representatives (known as the general assembly) of 246 members, both houses serving for two years. The legislature meets in Montpelier, the capital city, on the first Wednesday after the first Monday in January of the odd-numbered years. The supreme court consists of five members (a chief and four associate justices) elected by the general assembly for four-year terms. Six justices of the superior court, also elected (for two years) by the general assembly, preside over the county courts. Municipal judges are appointed by the governor for two-year term, and each town has a popularly elected justice of the peace. Local government in Vermont, as elsewhere in New England, is conducted largely by the town-meeting system. The state is represented in the U.S. Congress by two Senators and one Representative.

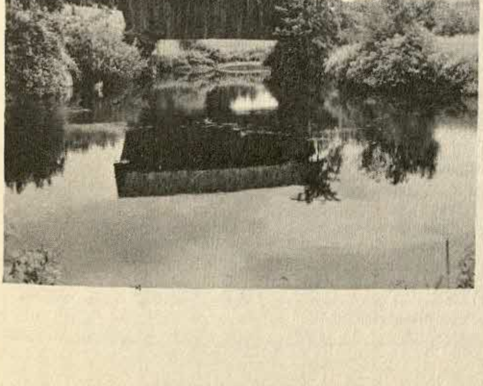
HISTORY

The French explorer Samuel de Champlain in 1609 discovered the lake named after him, in present-day Vermont. Both the French and the Dutch set up a few short-lived settlements in the area. In 1666 the French built a fortification and a shrine to Ste. Anne on Isle La Motte in Lake Champlain. It was not until 1724, however, that the first permanent white settlement was founded, at Ft. Dummer, near the present Brattleboro. This military post, set up by the Massachusetts Bay Colony to protect settlers in the Connecticut Valley from Indian attacks, was shortly followed by others. The original colonial land grants in this area had not been clearly defined; trouble ensued when, in the 1760's, Governors Benning Wentworth of New Hampshire and George Clinton of New York distributed overlapping land grants to individuals. In 1764, with the approval of Gov. Wentworth, New York laid claim to the New Hampshire grants, and a British court order subsequently awarded the disputed territory to New York. The people of the area west of the mountains, faced with the possibility of having to repurchase their lands from New York, rallied against the ruling in 1771, under the leadership of Ethan Allen and his Green Mountain Boys, among whom was his cousin, Seth Warner. The land-grant disputes were interrupted by the Revolutionary War, during which Allen and his forces supported the American cause. In May 1775 they captured Ticonderoga and Crown Point from the British. The organization subsequently became part of the Continental Army. In January 1777 the Vermont area seceded from New Hampshire and New York and organized itself into an independent state, to be known as "New Connecticut." In July of the same year, it adopted its own constitution and changed the

GLIMPSES OF VERMONT

In 1763 the Rev. Samuel Peters, in a token ceremony (*right*), called the area's green hills *Verd Mont*, which name, in Anglicized form, was adopted for the state in its constitution of 1777. Vermont is the nation's leading maple-syrup supplier. First the trees are tapped (*below*) by as many sap buckets as the trunk will accommodate; then the sap is boiled in large evaporators (*below right*) until it has been properly reduced (*courtesy Standard Oil Co., N.J.*). Quaint covered bridges (*bottom left*) are among the many tourist attractions of a state richly endowed with natural beauty. Its granite (*bottom right*) has made the town of Barre famous (*courtesy Vermont Development Comm.*)





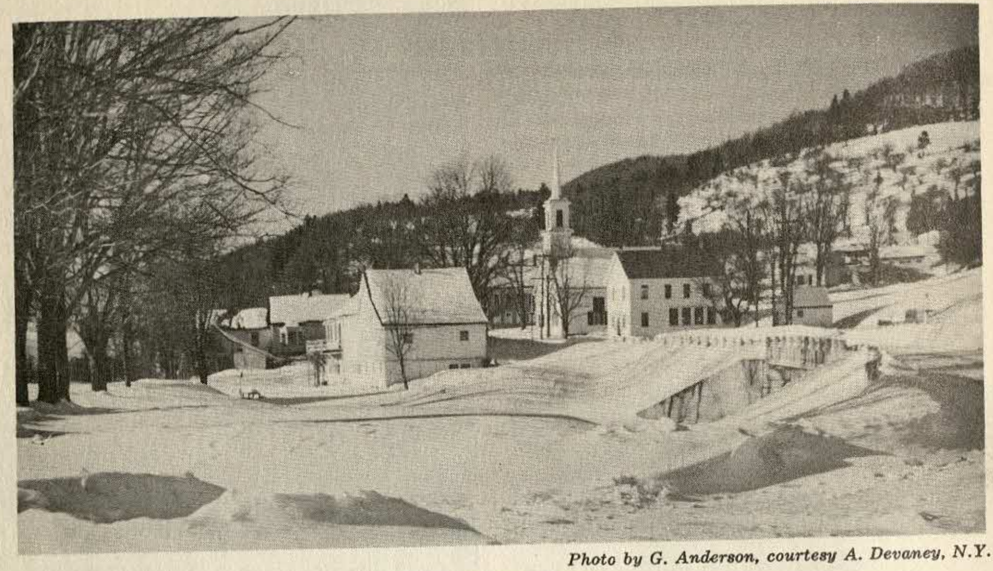


Photo by G. Anderson, courtesy A. Devaney, N.Y.

VIEW OF WEST DOVER

The snow-covered hills of Vermont provide an ideal setting for winter sports

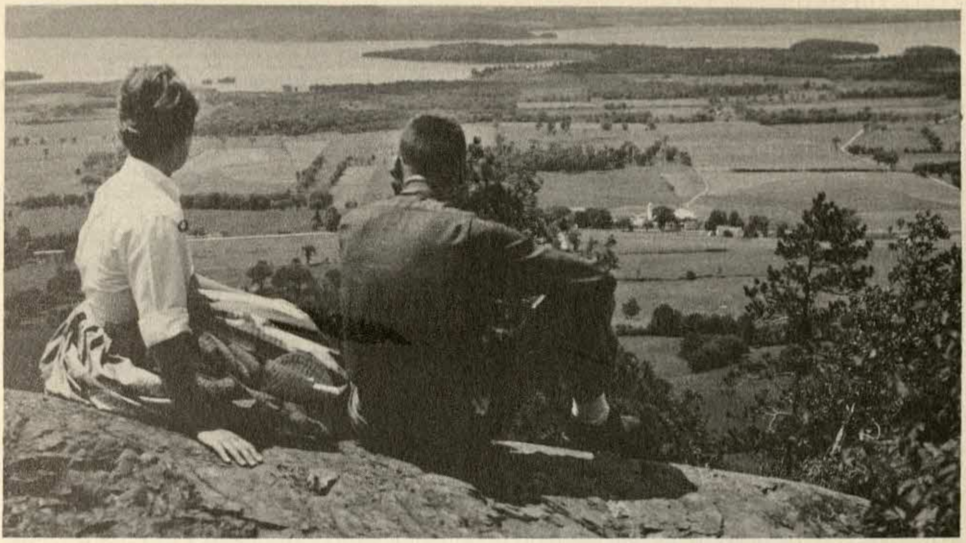
name to Vermont. Written into the bill of rights was the first proclamation in America prohibiting slavery. Massachusetts had agreed in 1781 to recognize Vermont's boundary, but the argument with New York was not settled until 1790, with the payment of $30,000 for the disputed territory. The Continental Congress, which had refused to admit Vermont into the Union until the boundary disputes were settled, then accepted the republic as the 14th state, on March 4, 1791.

During the War of 1812, Vermont troops fought in several important battles, such as the defense of Plattsburg in 1814. About 1832 the Antimasonic movement took a strong hold in the state, and, when William Wirt ran for the Presidency on the Antimasonic ticket, Vermont gave him all its electoral votes. Other causes that gained strong support in Vermont were the movements for temperance and for the abolition of slavery.

When the Civil War broke out, Vermont sent

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	*Size and Location*	*Points of Interest*
Green Mt. National Forest (established 1925)	629,004 acres, in west central Vermont (U.S. 4, 7; state 8, 11, 30, 100, 103A)	The Long Trail down the main chain of the Green Mts.; Texas Falls; Champlain Valley; quaint villages; historic sites; camping, hiking, swimming, fishing, skiing
Allis State Park (established 1931)	200 acres, in north central Vermont, near Brookfield (state 12, 14)	Auto road to 1,980-ft. summit; views; picnicking, tenting
Ascutney State Park (established 1935)	1,530 acres, in the southeast, near Windsor (U.S. 5)	Near summit of Mt. Ascutney (3,144 ft.), reached by paved motor road; scenic views; picnicking, hiking, camping
Branbury State Park (established 1935)	63 acres, in west central Vermont, near Brandon (U.S. 7, state 53)	Sand beach on Lake Dunmore; picnicking
Calvin Coolidge State Forest (established 1925)	11,537 acres, in east south central Vermont, near Woodstock (U.S. 4, state 100)	Camping, picnicking, skiing
Crystal Lake State Park (established 1937)	15 acres, in north central Vermont, at Barton (state 12)	White sand beach; picnicking
D.A.R. State Park (established 1949)	120 acres, in west central Vermont, near Addison (state 17, 22A)	Scenic area on Lake Champlain; Gen. Strong mansion; museum; historic area; camping, picnicking
Darling State Park (established 1934)	1,747 acres, in north central Vermont, near East Burke (state 114)	Summit of Mt. Burke (3,267 ft.), reached by paved motor road; hiking, camping, picnicking, skiing
Hazen's Notch State Park (established 1934)	60 acres, in north central Vermont, near Westfield (state 100)	Terminus of historic Bayley-Hazen Road of 1765
Monroe State Park (established 1940)	200 acres, in the northwest, near Huntington (off U.S. 2)	On Camel's Hump (4,083 ft.); bird sanctuary; game preserve; hiking
Mt. Philo State Park (established 1924)	160 acres, in the northwest, near Burlington (U.S. 7)	Summit of Mt. Philo (968 ft.), reached by paved motor road; scenic view from observation tower; foot trails, picnicking
St. Albans Bay State Park (established 1935)	45 acres, in the northwest, on Lake Champlain (U.S. 7)	Sandy beach; swimming, picnicking; marina
Sand Bar State Park (established 1933)	10 acres, in the northwest, on Lake Champlain (U.S. 2)	Beach on Lake Champlain; swimming, boating, fishing, camping, picnicking



Courtesy Vermont Development Commission

MT. PHILO STATE PARK

Hiking is a favorite sport on the foot trails through Vermont's hills

more than 34,000 men to support the Union cause. Saint Johnsbury gained the curious distinction of being the northernmost point to be subjected to Confederate attack when, on Oct. 19, 1864, a small party of Confederate soldiers swooped down from Canada, looted three banks, and went back to Canada. Vermont supplied 13,916 men to the armed forces in World War I and 38,055 men and women in World War II. Since the end of World War II, Vermont has continued trends previously begun: flood and erosion control, a movement toward urbanization, increasing stress on the concentration of schools in larger communities, and the development of manufacturing.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

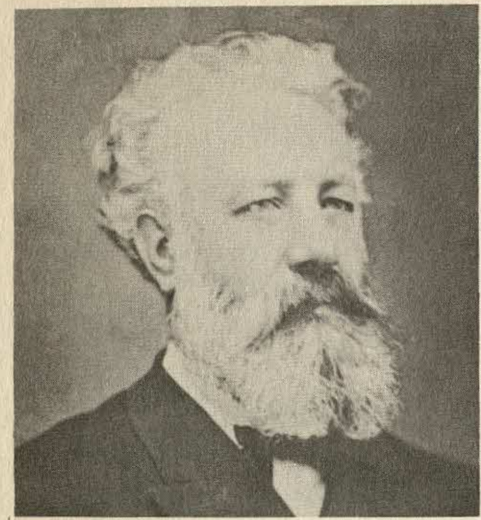
Vermont, UNIVERSITY OF, a coeducational state land-grant institution of higher learning at Burlington, Vt., founded in 1791. It comprises the colleges of agriculture and home economics, arts and sciences, education and nursing, medicine, and technology, the Graduate Coll., and a school of dental hygiene. The library has 200,000 volumes. The annual student enrollment totals *ca.* 3,200, and there are some 425 members of the faculty. The physical plant is valued at $10,500,000.

Verne (*vērn*), JULES, author, born in Nantes, France, Feb. 8, 1828; died in Amiens, France, March 24, 1905. After studying in his native city, he took a law course at Paris. He had already written several fairly successful plays when he began his remarkably popular series of science fiction with geographical and astronautical backgrounds. The first of these was "Five Weeks in a Balloon" (1863). It was followed by "A Journey to the Center of the Earth" (1864), "From the Earth to the Moon" (1865), "Twenty Thousand Leagues Under the Sea" (1870), "The Mysterious Island" (1870), "Around the World in Eighty Days" (1872), and "Michael Strogoff" (1876). Many of Verne's books, in which he prophesied rather accurately later technological progress, were made in-

UNIVERSITY OF VERMONT

Ira Allen Chapel and Wilbur Library

Courtesy Univ. of Vermont



Courtesy Gramstorff Bros., Malden, Mass.

JULES VERNE

to motion pictures, the best known being "Around the World in Eighty Days" (produced by Mike Todd, 1956). For an illustration from one of his 19th-century editions, see *Astronautics:* HISTORY.

Vernet (*vĕr-nā'*), CLAUDE JOSEPH, painter of seascapes, born in Avignon, France, Aug. 14, 1714; died in Paris, Dec. 3, 1789. He was first instructed in painting by his father, Antoine Vernet, and in 1732 went to Italy, where he remained for 20 years. He became known for the sea views which he painted while in Rome and in 1753 was recalled to Paris by Louis XV to paint a series of 15 vistas of major seaports of France. These paintings are today in the Louvre in Paris. Vernet's large canvases are highly decorative; they are distinguished by the liveliness with which he depicted nature, and by the special atmospheric effects which he gave to his marine scenes.

Vernet, ÉMILE JEAN HORACE, painter of military and battle scenes, born in Paris, France, June 30, 1789; died there Jan. 17, 1863. A son of Antoine Carle Vernet (1758-1836) and a grandson of Claude Joseph Vernet, both painters, he studied painting under his father and later with Jean Michel Moreau and F. A. Vincent. He finished his famous painting, "Taking of an Entrenched Camp," when he was only 20. His works are noted for realistic treatment of the subject, distinguishing them from the classical style of Jacques Louis David (*q.v.*) and others of his contemporaries. Although Vernet was a staunch supporter of Napoleon, both during the latter's life and after his death, Charles X appointed him director of the French Academy at Rome and later Louis Philippe commissioned him to paint the battlefields of Jena, Wagram, Friedland, and others. Vernet toured Egypt in 1840 and in 1842 visited St. Petersburg, whence he went with Czar Nicholas to Sebastopol. He accompanied the French army during the Crimean War to witness several battles. Among his best-known paintings are "The Battle of Wagram," "Dog of the Regiment," "Defense of the Barrier at Clichy," "Soldier of Waterloo," and "Battle of the Alma."

Vernier (*vĕr'nĭ-ĕr*), a supplementary scale for reading subdivisions of a larger graduated scale. It was named from Pierre Vernier of Brussels, who invented it in 1631. The vernier may move along the body of a main scale and below it, as in the caliper square. In the micrometer caliper, a thimble bearing the fixed scale rotates around the vernier, which appears on the barrel of the micrometer.

In the case of a standard scale divided into inches, with each inch divided into 10 parts, and each tenth-part of the inch divided into four parts, it is clear that in measuring a bolt, for example, a direct reading from this scale will indicate its length in the number of inches, the number of tenths of an inch, plus the number of 40ths of an inch. If the bolt measures 2 in. (2) plus 3/10 (.3) in., plus 2/40 (.050) in., it will be a total of 2.350 in. long. If this main scale is now equipped with a vernier, the vernier will not be graduated in intervals of .025 in. (40ths of an inch as is the main scale), but will be graduated in intervals of .001 in. less, or .024 in. each, and 25 of these divisions will equal 24 of the 40th-division marks on the main scale. Obviously, when the vernier's number 1 coincides with a division mark on the main scale, the zero on the vernier is .001 in. beyond the main scale's preceding division mark. If the vernier's number 2 coincides with a division mark on the scale above, the zero of the vernier has moved .002 in. from its preceding mark on the main scale.

In the example above, the vernier scale's zero mark would coincide with the second 40th-of-an-inch mark beyond the 3/10 mark on the main scale. If, however, the bolt were slightly longer, it might be found that the zero of the vernier did not coincide with the second 40th mark on the main scale, but was slightly beyond it, and that the 18th vernier graduation was the first to coincide with the graduation on the true scale. Then the length of the bolt would be determined as follows: From the main scale read 2 in. plus .3 in. plus .050 (the 2/40 in.). From the vernier read the 18 thousandths of the in. as .018. Add these figures together to find that the bolt now measures 2.368 in. In other words, it was possible to determine, by using the vernier, that the bolt is .018 in. longer than could be measured by use of the main scale alone. Thus the vernier enables exact fractions to be determined from subdivisions of larger scales.

Verniers are attached to many astronomical and geodetical instruments, and to apparatus used to make exact measurements for the manufacture of precision machinery or tools.

Vernoleninsk (*vĕr-nō-lĕn′ĭnsk*) or NIKOLAEV, a seaport city of the U.S.S.R., situated at the confluence of the Bug and Ingul rivers in the Ukrainian Soviet Socialist Republic, capital of the region of Nikolaev. Strategically located on the Black Sea, about 70 m. from Odessa, it is an important naval station with modern shipyards and a strongly fortified harbor. The city also has numerous arms and munitions plants and depots. The chief exports include grain, oil, sugar, wool, iron ore, and varied manufactured products, principally farm implements, glass, tobacco, and boots. The city was founded in 1791. During World War II, Vernoleninsk was taken by the Germans (Aug. 17, 1941) and the naval base destroyed, but the city was recaptured by the Russians in March 1944. Population, 1959, 224,000.

Vernon (*vĕr′nŭn*), EDWARD, admiral, born in Westminster, England, Nov. 12, 1684; died in Suffolk, Oct. 30, 1757. He was the son of James Vernon, who was secretary of state from 1697 to 1700. Young Vernon entered the navy at 16. He witnessed the capture of Gibraltar (1704), took part in other battles in the Mediterranean, and in 1708 sailed to the West Indies.

Admiral Vernon captured (1739) the Spanish city of Porto Bello, Panama, with the loss of only seven men. In 1741, he was given command of a large fleet to attack Cartagena, Colombia, but was defeated with severe loss and compelled to retire to Jamaica. When Prince Charles, the Pretender, threatened London, Vernon was given command of the fleet to guard the coasts of Sussex and Kent. Due to a quarrel with the admiralty, however, his name was stricken off the list of flag officers (1746). Vernon, whose nickname was "Old Grog" because of a grogram cloak he wore, was the first to issue "grog," rum mixed with water, to his men. Before his time, rum or wine has been served undiluted to sailors, which resulted in much drunkenness and inefficiency on shipboard.

Vernon served in Parliament from 1722-34 and while he was at Cartagena he was again elected to that body, serving at various times between 1741 and 1757.

Lawrence Washington, elder brother of George Washington, served under Adm. Vernon on his expedition against Cartagena; his admiration for his superior led him to name his home on the Potomac Mt. Vernon.

Verona (*vē-rō′nȧ*), a city of Northern Italy, capital of the province of the same name; located on the Adige River, 68 m. w. of Venice. The surrounding country is picturesque and noted for its general fertility. Substantial walls, begun by Emperor Gallienus in A.D. 265 and completed by Charlemagne, surround the city. Verona is a trade and industrial center. Among the manufactures are cotton and silk textiles, woolen goods, hosiery, hats, pottery, jewelry, earthernware, and machinery. Fruit culture and livestock raising are important industries in the surrounding country and large quantities of wine and preserved fruits are produced. There is also an important trade in cereals, sausages, cattle, and dairy products.

VERONA. BRIDGE OVER THE ADIGE RIVER

Verona is rich in architecture and monuments from classical times as well as from the medieval period. Its arena from the 1st century B.C. is one of the largest Roman amphitheaters still extant. Today it is used for musical, especially operatic, performances. The Roman theater, constructed under Augustus, today is reserved for dramatic performances, especially Shakespearean drama. Since two of Shakespeare's plays, "Romeo and Juliet" and "Two Gentlemen from Verona," are set in the city, the Shakespearean tradition is strong. One of Verona's most famous Roman bridges, the Ponte della Pietra, was destroyed during World War II. The cathedral (Il Duomo), begun in 1139, and the churches San Zeno Maggiore (begun 1139) and Sant' Anastasia (begun 1290) are beautiful examples of Romanesque architecture. The palace and tombs of the Scaligeri, who ruled Verona in the 13th and 14th centuries, are famous 14th-century structures. The Piazza delle Erbe, once the ancient forum and today the vegetable market, is one of the most picturesque squares in Northern Italy.

Originally founded by the Celts, the city entered Roman history in 89 B.C., and soon after became a prosperous commercial center. Constantine I captured it in 312, Theodoric in 489, and Charlemagne in 774. Its subsequent history is that of

Northern Italy, which became part of the kingdom of Italy in 1866. Verona played a part in World War II when it was captured by the U.S. 5th Army, in April 1945. Population (1950), 162,416.

Veronal (*vĕr′ō-nạl*), the trade-mark name of a narcotic drug administered under physician's order to produce sleep.

Veronese (*vâ-rô-nā′zâ*), PAOLO, the popular name of Paolo Cagliari, painter, born in Verona, Italy, in 1528; died in Venice, April 19, 1588. He was the son of Gabriele Cagliari, a sculptor, who taught the son the skills of his own art. Paolo's interest in painting caused him to be placed under his uncle, Antonio Badile, under whom he rapidly developed skill as a painter of Biblical and historical scenes. He painted successively in several Italian cities, including Rome and Venice, making the latter his residence in 1555. There, in the Church of San Sebastiano, frescoes and the great altarpiece prove Veronese's mastership. His concepts, in his composition as well as his magnificent coloring effects, show him clearly as a Venetian and a younger contemporary of Titian and Tintoretto (he ranks with the latter artist in the number and beauty of his productions). Whether his topics were secular—taken from the rich treasure of ancient mythology—or religious, in the decorative costumes of the Renaissance period, he always excelled in creating brilliant surfaces and rich, colorful compositions. With such large canvases as "The Marriage at Cana," "Feast at the House of Simon," and "Feast in the House of Levi," he became pre-eminently the painter of banquets and feasts. Among his other famous paintings are "Rape of Europa," "Venice, Queen of the Sea," "Calling of St. Andrew to the Apostleship," "Consecration of St. Nicholas and St. Helena," "Family of Darius at the Feet of Alexander," and "Vision of the Invention of the Cross."

MARS AND VENUS UNITED BY LOVE
PAINTING BY PAOLO VERONESE

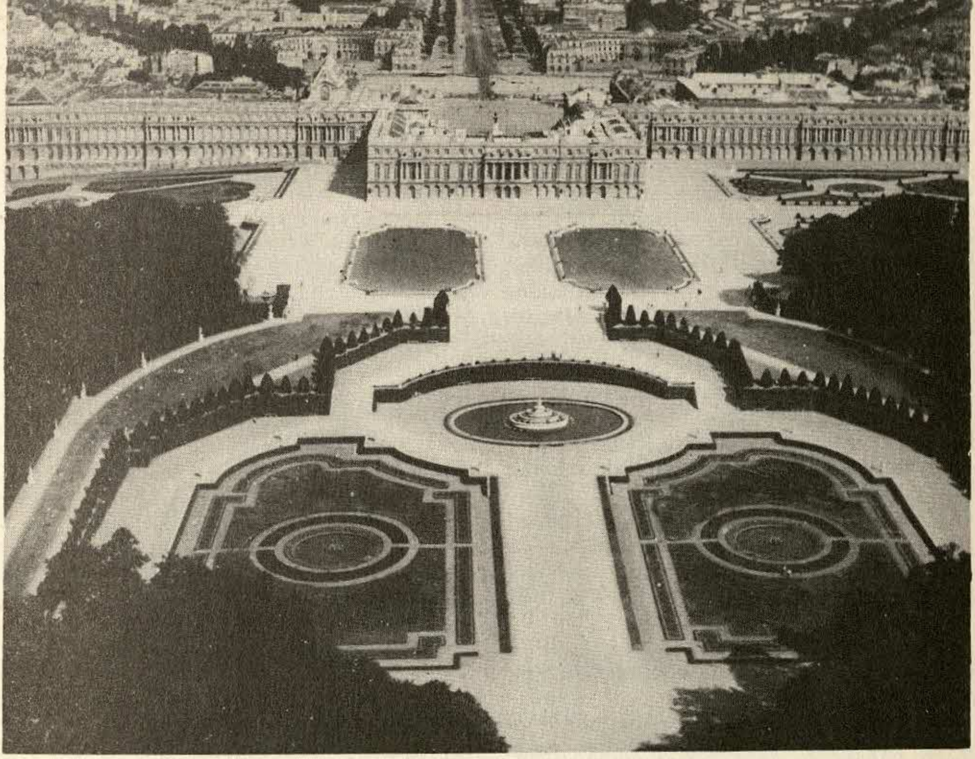
Courtesy Metropolitan Museum of Art, N. Y.

Veronica (*vẹ-rŏn′ĭ-ḳȧ*), or SPEEDWELL, annual and perennial herbaceous plants and shrubs, widely distributed all over the world in temperate and cold climates. Some are used in medicine. There are about 16 types of veronica native to North America, and several of the perennial types, with blue, pink, or white blossoms, are grown in domestic gardens. See also *Speedwell.*

Veronica, SAINT, a figure in the legends of many countries, connected by tradition with the passage of Christ to Calvary. She is sometimes identified as a native of Jerusalem. A 13th-century narrative relates that, at the time Christ was bearing the cross to Golgotha, she met the Saviour, on whose brow she observed the sweat caused by the weight of the cross, and gave him her veil to wipe off the perspiration. As Christ removed the sweat from his brow, his features were miraculously marked upon the veil, with which Veronica later converted the Roman emperor Tiberius to the view that Christ is divine. The veil is still preserved by the canons of St. Peter's in Rome, but Veronica is not listed as a saint by the Church. It is probable that the name Veronica, in the absence of the real name of the person who offered the veil, was applied to her. The name Veronica from the Latin *vera* (true) and Greek *icon* (image) could mean *true image* or *picture.*

Verrazano (*vär-rä-tsä′nô*), GIOVANNI DA, navigator and explorer, born in Florence, Italy, *ca.* 1480; died in Calmenar, Spain, in 1527. He became a navigator at an early age and in 1522 captured a cargo valued at $1,500,000, which Cortez had sent from Mexico to Charles V of Spain. In 1524 he landed at Cape Fear, N.C., and thence sailed northward to Portsmouth, N.H. Little is known of his later life, but Spanish records say that he returned to Europe in 1526, where he obtained aid from France to make a second voyage to America. This account states that he was captured by the Spanish and taken to Spain, where he was executed by the order of the emperor. Another account, however, says that he was killed by West Indian natives during the second voyage. Several letters were published in 1524 in which an account was given of the voyages of Verrazano and his explorations of the Atlantic coast of North America from 34° to 50°.

Verres (*vĕ′rēz*), Roman governor of Sicily, born, *ca.* 120 B.C.; died in 43 B.C. He was appointed quaestor in Cisalpine Gaul in 82 B.C., two years later served in the army of Asia, and shortly



Courtesy French Press & Information Service, N. Y.

PALACE AND GARDENS OF VERSAILLES

after was made governor of Sicily. His government in the rich island province is famous for the greed and cruelty with which he enriched himself and impoverished the people. The Sicilians at last tired of his tyranny and brought him to Rome for trial in 70 B.C., where he was defended by Hortensius and accused by Cicero. The orations of Cicero against Verres were so powerful and convincing that the latter fled to Marseilles (Massilia), where he lived in exile for 27 years. Some of his possessions were craved by Antony, who therefore caused his death by proscription.

Verrill (*vĕr'ĭl*), ADDISON EMERY, zoologist, born at Greenwood, Me., Feb. 9, 1839; died Dec. 10, 1926. He was graduated from Lawrence Scientific School, Harvard Univ., in 1862, and became professor of zoology at Yale. From 1867 to 1870 he was professor in the Univ. of Wisconsin. He gave special attention to marine zoology, investigated the invertebrate fauna of the Atlantic coast, and published much of value regarding mollusks, polyps, and the squids of the North Atlantic. Subsequently he investigated the geology of the marine animals of the Bermuda Islands and made a fine collection of specimens, which were placed in the Peabody Museum of Yale Univ. Among his chief publications are "Revision of the Polypi of the Eastern Coast of the U.S.," "Report Upon the Invertebrate Animals of Vineyard Sound," "Cephalopods of the Northeastern Coast of America," and "The Bermuda Islands."

Verrocchio (*vâr-rôk'kyô*), ANDREA DEL, Italian sculptor, goldsmith, and painter, born 1435, Florence; died 1488, Venice. Starting as a goldsmith, he turned to sculpture and many works in marble as well as in bronze give proof of Verrocchio's mastership, his importance being similar to that of Donatello (*q.v.*). Verrocchio's works are not as severe as most of Donatello's, especially when one compares similar topics of both artists, such as their statues of the young David, or Verrocchio's equestrian statue of Bartolommeo Colleoni in Venice and Donatello's Gattamelatta in Padua. Among Verrocchio's groups, Christ and St. Thomas at Or San Michele, Florence, is best known. In his paintings, Verrocchio shows the approach of a sculptor. His role as a painter would not be of great importance, however, except for the fact that he was the teacher of Leonardo da Vinci (*q.v.*) who is said to have painted one of the angels in Verrocchio's canvas "Baptism of Christ."

Verruca (*vĕ-rōō'kȧ*). See *Wart.*

Versailles (*vâr-sī'*), a city in France, capital of the department of Seine-et-Oise, 10 m. s.w. of Paris, with which it is connected by railway. Tourists regard it as one of the handsomest cities of Europe; it has long, tree-shaded streets, beautiful gardens and parks, and many fine buildings. It is noted also for its historic significance. The city has few manufactures and little more than local trade. Versailles dates from the time of

Louis XIII, who maintained a country villa here, which he made his residence while hunting and vacationing. Louis XIV spent large sums of money in building the world-famous Palace of Versailles, designed by the architect Mansard (1646-1708), and in embellishing the city. Later he made it the permanent seat of his court. Interior alterations and decorations were made by Louis XV, and the city continued to be a court residence down to the revolution of 1789. The palace was converted by Louis Philippe into a museum, in which form it still exists. The palace is 1,400 ft. long and is decorated within and without by beautiful forms of architecture. In the museum are collections of paintings and statues from the time of Clovis to the present. Among the notable paintings are those of Émile Jean Horace Vernet, illustrating the career of Napoleon. See also color plate, *Architecture II*, Volume XII.

Among the prominent features are some of the largest and finest fountains in the world, the Grand and the Petit Trianon (*q.v.*), beautiful statuary and monuments, and costly paintings. In the vicinity are extensive orchards, orange groves, and gardens of flowers. The water supply is carried by a canal 200 ft. wide and 1 m. long, which is lined on both sides by avenues of trees.

Versailles was made the headquarters of the German army in October 1870, and in its palace King William I was proclaimed emperor of Germany in 1871. It was the seat of the French government from 1871 to 1879 and the headquarters of the army during the Commune. The Treaty of Versailles, signed in 1783, recognized the independence of the U.S. On June 28, 1919, the Treaty of Versailles, closing World War I (*q.v.*), was concluded here. Population, 1946, 70,141.

Verse (*vẽrs*), a single line of poetry, consisting of a certain number of accented and unaccented syllables. The ancients established 30 short syllables as the maximum length of the verse, and counted a long (*i.e.*, stressed) syllable as equal to two short (unstressed) ones. In ancient lyric poetry, however, the verse was often permitted to exceed this length. In modern poetry each verse is marked theoretically by one chief stress, and a slight pause is frequently assigned at the end, particularly of rhyming verses, to accentuate the rhyme. *Blank verse* is iambic pentameter (five iambic feet to a line) and the verses do not rhyme. The works of Shakespeare, Wordsworth, and Tennyson contain much of the best and most typical blank verse in English. *Free verse* (from the French *vers libre*) is a term applied to poetry in which the rhythms are by stresses according to words or meaning rather than by the repetitive "foot" patterns of "conventional" poetry. The poems of Carl Sandburg and Stephen Benét contain many examples of this type of verse. Poetry in a collective sense is often referred to as verse; and sometimes a critical distinction is drawn between "poetry" as a higher and more serious form and "verse" as the lighter (or, sometimes, less meritorious) form of poetry. The word verse is often also used as equivalent to "stanza," although this use is so loose as to be virtually erroneous.

Vertebrate (*vẽr′tê-brât*), the name for animals possessing a backbone or spine divided into numerous separate joints or vertebrae, from which the name *Vertebrata* or *Vertebrates* is derived. They include the fishes, amphibians, reptiles, birds, and mammals, all of which are designated as jawed vertebrates (*Gnathostomata*). Most of the more ancient, jawless types of vertebrates (*Agnatha*) are extinct, but they are represented today by the lampreys and so-called hagfishes (*Cyclostomata*). Man is a typical but highly advanced and specialized vertebrate, belonging to the highest class, Mammalia, of the Vertebrata.

Vertebrates are usually bilaterally symmetrical and always have a well-developed internal skeleton composed of numerous separate pieces of cartilage, bone, or both. Paired fins or limbs are usually present, but may be secondarily lost, as in the snakes. A highly developed brain is present and is protected by the bony or cartilaginous skull. Special sense organs are also highly developed; the most important of these are closely connected with the brain and are also protected, at least in part, by the skull: especially the eyes (sense of sight), nose and mouth (senses of smell and taste), internal ear (sense of hearing and of balance). From the brain a hollow nerve tube, the spinal cord, runs along the back above or within the vertebral column, and from this nerves extend to the skin, muscles, and other organs of the body.

The body is covered with a protective skin, which may be naked (as in the frog) or may contain or give rise to additional protective structures such as scales (fishes, snakes, etc.), bony plates (armadillos, etc.), feathers (birds), or hair (mammals).

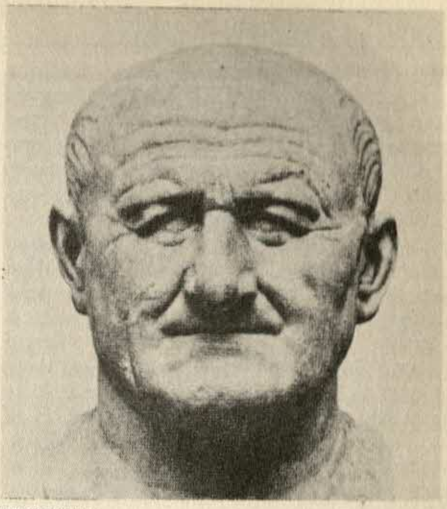
The complex digestive system consists of an open tube, usually complicated by folds and local enlargements, running from the mouth to the anus and with characteristic accessory organs and glands, including the liver, pancreas, and spleen. The circulatory system is also more complicated than in nonvertebrates. The heart, a pump, drives the blood through a closed, circular system of arteries, veins, and capillaries, and in the course of this circulation the blood gives up carbon dioxide and acquires oxygen, mainly in special organs: gills in most aquatic forms and lungs in air-breathers. The blood is red because of the presence of blood corpuscles containing a red chemical compound, hemoglobin. A few fishes are hermaphroditic, but in most lower and all higher vertebrates the sexes are normally separate.

Vertigo (*vĕr′tĭ-gō*), or DIZZINESS, a sensation of lack of equilibrium, a symptom of some forms of cerebral disturbances, usually attended with obscurity of vision and disordered movements. The effect is that the intelligence is not able to correct the erroneous suggestions of the senses. Vertigo may arise from the presence of too much or too little blood in the brain, or from the effect of poisons upon the circulation. Sometimes it results from objects passing swiftly across the field of vision, as water falling rapidly from a great height, or from ascending to unaccustomed heights. Vertigo may be due to diseases of the ears or nerves of hearing (*auditory* or *aural vertigo*), the eyes or ocular nerves (*ocular vertigo*), the brain (*cerebral vertigo*), or the stomach and intestines (*gastro-intestinal vertigo*). *Epileptic vertigo* is that which is associated with or precedes epilepsy.

Vertumnus (*vĕr-tŭm′nŭs*), a divinity of ancient Rome, worshiped as the deity who presided over changes and transformations, especially the blooming and bearing of trees and other plants. It was possible for him to assume any shape he pleased. He fell in love with Pomona, the goddess of the fruit of trees, who became his wife. Gardeners offered garlands and buds to him on the 23d of August.

Verviers (*vĕr-vyā′*), a city of Belgium, in the province of Liége, 15 m. E. of Liége. It is located on the Vesdre River and has good railroad facilities. The noteworthy buildings include the Church of St. Remacle, the city hall, and the central railroad station. Verviers is noted for its manufacture of cloth; other manufactures include confectionery, machinery, soap, leather, chemicals, ironware, dyes, and clothing. Its fortifications were destroyed by Louis XIV of France. It was held by the Germans in both world wars. Population, *ca.* 40,000.

Vespasian (*vĕs-pā′zhĭ-ạn*), TITUS FLAVIUS, Emperor of Rome, born in the Sabine town of Reate, Nov. 17, in the year 9 A.D.; died there June 24, 79. He was of common birth and was the first plebeian to attain the throne of Rome. After serving with the army in Thrace, he was made quaestor in Crete and Cyrene, and rapidly rose to the offices of aedile and praetor. He served in Germany from 43 to 44 and in the reign of Claudius had command of a legion in Britain. He was sent as governor to Africa, where his reign is described as honorable and upright. In 66 he was appointed by Nero to conduct the war in Judaea, where he distinguished himself by his military successes. While in Caesarea in 69 he was proclaimed emperor, first by an army in Egypt and later by his troops in Judaea. Vitellius claimed succession to the throne after the death of Galba and was supported by the Roman troops in Gaul and Germany, but the eastern army was unanimous in declaring for Vespasian and soon defeated Vitellius and captured Rome. Vespasian entered the capital in 70, where he was hailed by the people and recognized as emperor by the senate.



VESPASIAN

Vespasian had married Flavia Domitilla, daughter of a Roman knight, by whom he had two sons, Titus and Domitian. Titus was placed in command of the army in Judaea and soon ended the Jewish War by capturing Jerusalem, thus restoring peace in the Roman world in the first year of Vespasian's reign. The succeeding nine years of his government are memorable for the peace that Rome enjoyed, the *peace of Vespasian* passing into history as a proverbial phrase. Once firmly established on the throne, he restored the capitol, which had been burned when Rome was taken by his army. He reorganized the army, reformed the civil service, constructed public baths and a new Forum, built the Temple of Peace, and began the Colosseum. He encouraged artists and men of letters, granting handsome pensions to Quintilian and a number of others. He was succeeded as sovereign by his sons, Titus and Domitian.

Vespucci (*vĕs-pōōt′chē*), AMERIGO, astronomer and navigator, born in Florence, Italy, Mar. 9, 1451; died in Seville, Spain, Feb. 22, 1512. He was educated under the patronage of his uncle, a scholarly Dominican and a friend of Savonarola. His preference as a student was for philosophy, geography, and astronomy. After finishing his studies at school, he became a clerk in the commercial house of the Medici, then the ruling family of Florence. In 1490 he accompanied Lorenzo de' Medici to Spain on a commercial enterprise. On May 10, 1497, he sailed from Cadiz on an expedition to America. The tour was designed more particularly for astronomical research than geographical discovery, but the enterprise was fruitful in both lines. After cruising on the shores of the Canary Islands, the expedition of four vessels crossed the Atlantic in 27 days and reached the Bay of Campeche, the southern extension of the Gulf of Mexico. The expedition next doubled Cape Sable and cruised along the Atlantic coast of North America to Cape Hatteras, whence it returned to Spain in 1498. Vespucci made a second voyage to America in 1499, when he cruised along the coast of Brazil from Cape St. Roque to Lake Maracaibo, and thence sailed to the island of San Domingo. In 1501 he sailed under Dom Emanuel of Portugal and explored the coast of South America from Cape St. Roque to the Bay of Rio de Janeiro.

Vespucci sailed with an expedition for Malacca in 1503 under the Portuguese, but his ship became separated from the others and sailed to Brazil, reaching the Bay of All Saints. He sailed southward from the vicinity of Bahia and explored the coast of Cape Frio, where he built a fort. In 1504 he returned to Lisbon, Portugal, and the following year entered the Spanish service, taking up residence at Seville. The remainder of his life was devoted largely to writing accounts of his various journeys and preparing maps of his routes and explorations. Only a few of his writings are extant, most of our sources of information being from quotations and allusions to his works. It is quite certain that he reached the mainland of America in 1497, 18 days before Cabot. A book published in 1507 by a geographer named Waldseemüller at Freiburg, Germany, contains numerous allusions to the discoveries of Vespucci and other explorers. He makes the statement: "Now a fourth part [of the world] has been found by Amerigo Vespucci, and I do not see why we should be prevented from calling it Amerige or America." It is from this work that the New World became known as America.

AMERIGO VESPUCCI

Vesta (*vĕs′tȧ*), a Roman deity, the goddess of fire and of the hearth. Her temple in Rome, containing as it were the hearthstone of the nation, stood close beside the palace of Numa Pompilius. Never-ceasing fire burned on her altar, which was attended by priestesses called Vestal Virgins. It is said that Numa established the vestals, four in number, but afterward they were increased to six. They were chosen from the noblest families in Rome at the ages of 6 to 10 years and held their office for 30 years. The first 10 years were devoted to initiating them in their religious duties, which they performed for the second 10, and the third period was occupied in instructing new priestesses. They were supported from the public treasury and received many special privileges, such as the best seats in the theater and the honor of being accompanied by a lictor while riding in state. If they met a criminal on his way to execution they had the power to pardon him, provided the meeting was accidental. The vestals were vowed to chastity and a violation of the vow was punished by the offender being stoned to death or buried alive. The *Vestalia,* a festival held in honor of Vesta, occurred on June 9. It was celebrated exclusively by women, who walked barefooted in procession to the temple of the goddess. With the adoption of Christianity by Constantine in the 4th century, the worship of Vesta ceased.

Vested Rights (*vĕs′tẹd rīts*), a legal phrase referring to fixed and clearly established interest. Vested rights are the opposite of contingent rights, which depend on some event or condition which is uncertain and may be prevented by an opposed event or condition. Vested rights are rights that so clearly reside in a certain person or persons that they have acquired a certain force and legality, and it is the duty of the government to protect them. They may not be arbitrarily violated, and when public welfare demands that they be interfered with, the interested person or persons must be duly compensated. Adequate

Official U. S. Navy Photo

MT. VESUVIUS IN ERUPTION

protection for these rights is guaranteed to the citizens of the U.S. by the 14th and 15th Constitutional Amendments.

Vestments (*vĕst′mẹnts*), in the Roman Catholic Church, the special dress worn by the priest, the choir, etc., for the celebration of the mass and other liturgical acts. They are prescribed by canonical law. Among the vestments are the chasuble, stole, girdle, etc.

Vesuvius (*vē-sū′vĭ-ŭs*), a famous volcano in Italy, situated near the Bay of Naples, about 10 m. E. of the city of Naples. The mountain rises from the plain of Campania. It has a circumference of 30 m. at its base and rises 4,225 ft. above the level of the sea. The surrounding plain is about 2,200 ft. above the sea, thus making the pyramidal cone 2,025 ft. above the adjacent country. In ancient times it had but one peak, but now there are two distinct summits, known as Somma and Vesuvius. Monte Somma is a precipice forming the wall of an ancient, prehistoric crater greater than that of the present volcano, and the mountain is thought to be only half as high as in former times, its upper half having been blown away by a colossal eruption of which no historical record remains. The cone lies south of Monte Somma, from which it is separated by a valley known as Atrio del Cavallo, and at the western end of the valley is an observatory, at which the eruptions and indications of disturbances are studied. The distance across the cone is 2,000 ft. and it slopes inward to a depth of 500 ft., forming a cup-shaped crater. Tourists may ascend to within a short distance of the mouth of the crater by a cable railway, where they have a fine view of the surrounding country, and may study the substances brought up by volcanic eruptions, which include 40 different minerals.

Though earthquakes and eruptions have taken place in the region of Vesuvius at various times since the beginning of the historic period, it has been densely populated for more than 20 centuries. The earliest recorded symptoms of activity occurred in 63 A.D., but it is reasonably certain that vast disturbances took place at a much earlier period. Pompeii and Herculaneum, two cities near the base of Vesuvius, were buried by an eruption in 79. Excavations made in modern times have established the fact that lava was not emitted during this eruption, but that the inundation took place when the steam given off by the mountain became condensed into rain, which mixed with the light volcanic dust and flowed down the slope, thus covering the surrounding region with a pasty mud. Numerous eruptions have occurred since then, one of the most serious being the great eruption of 1631 in which some 18,000 persons lost their lives. One of its more recent eruptions occurred in March 1944, with a resultant loss of several lives. On the slopes of Vesuvius are fine gardens and orchards, producing grapes, oranges, lemons, apples, and vegetables.

Veterans Administration (*vĕt′ẽr-ạnz ăd-mĭn-ĭ-strā′shŭn*), U.S. (abbreviated VA or V.A.), a Federal agency charged with administering benefits for veterans and their families. The benefits fall into three broad categories: readjustment benefits, such as GI schooling and GI loans, to help veterans re-establish themselves in civilian life; rehabilitation benefits, to assist disabled veterans regain independence in spite of their handicaps; and benefits for the families of deceased veterans.

Early legislation regarding veterans was confined almost exclusively to the matter of pensions (*q.v.*). In 1636 the Pilgrims of Plymouth enacted a law providing that "if any man shalbee sent forth as a souldier and shall return maimed hee shalbee majtained competently by the Collonie during his life." A Resolution of the Continental Congress, dated Aug. 26, 1776, promised pensions to soldiers and seamen who might be disabled in the Revolutionary War. A Federal act of Sept. 29, 1789, provided that the Federal government should assume responsibility for the pensions which had previously been granted and paid by the several states. On March 2, 1833, an act created a Commissioner of Pensions, who was to administer pension laws under the direction of the Secretary of War. An act of Jan. 19, 1849, made the Bureau of Pensions part of the new Dept. of Interior. It remained a part of the Interior Department until 1930.

Medical care for veterans dates back to the early days of the Civil War in 1861, when the Secretary of War appointed a sanitary Commission to study health conditions of Union soldiers. As an outgrowth of the commission's recommendations, Congress, in March 1865, formed a National Home for Disabled Volunteer Soldiers—actually a number of homes in various parts of the country caring for disabled veterans.

The next agency formed to handle veterans' benefits came into being during World War I. This was the Bureau of War Risk Insurance, originally established to insure cargoes of shippers on the high seas, but broadened in 1917 to administer an entire new system of veterans' benefits for those who served in World War I. Included were programs of disability compensation for veterans disabled in service, insurance for servicemen and veterans, a family allotment program for servicemen, and vocational rehabilitation training for the disabled.

Two other Federal agencies joined in the administration of a number of these programs—the Federal Board of Vocational Education and the Public Health Service. On Aug. 9, 1921, the Veterans Bureau was created to place the work of the three agencies under single jurisdiction. On July 3, 1930, a law was passed authorizing the President to "consolidate and coordinate governmental activities affecting war veterans." Under authority of this law, the President formed the Veterans Administration (VA), which took over the functions of the Veterans Bureau, the Pension Bureau, and the National Home for Disabled Volunteer Soldiers.

With World War II, functions of the VA suddenly expanded. The number of veterans in America grew from 4,000,000 before the war to 20,000,000 just after the war. New benefits were enacted: a program of GI insurance; the GI Bill with its programs of education and training, its government-guaranteed loans, and others. The VA's medical and hospital program more than doubled. The Korean conflict added still more benefits: a Korean GI Bill, a new system of GI insurance, and others.

By the close of 1956, the nation's population of living veterans had risen to 22,600,000. Of them, nearly 70 per cent, or 15,345,000, served in World War II. Korea veterans numbered 5,000,000 (including 890,000 who also had seen World War II service). World War I veterans totaled 3,000,000. The remainder served in earlier wars and during time of peace.

Following are some of the major benefits for veterans, administered by the VA:

Hospital and medical care: The VA operates 173 hospitals for the care of ill and disabled veterans. Priority for admission is given first to veterans for treatment of service-connected conditions. Veterans with nonservice-connected ailments are next in order, provided they are unable to pay for private hospitalization and provided beds are available for them. They also must submit statements of their assets and liabilities. Outpatient medical care in clinics or from private physicians is available only for the treatment of service-connected disabilities.

Education and training: Under the Korean GI Bill, eligible Korean veterans may be entitled to up to 36 months of training in schools and colleges, on the job or on the farm. For each month of GI training, the VA will pay veteran-students an allowance ranging from $70 to $160, depending on the type of training and the number of dependents. This is the only payment made. All expenses—tuition, fees, books and the like—must come out of the monthly allowances.

The law allows veterans to change their course only once. To help veterans select the course best suited to their aptitudes and abilities, VA vocational counseling is available.

Another similar GI training program, for World War II veterans, virtually reached its end on July 25, 1956. More than half of the nation's World War II veterans, or 7,800,000, received training under this program during its 12 years of existence.

Vocational rehabilitation: Vocational rehabilitation training is available to service-disabled Korea veterans who need it to overcome the handicap of their disabilities. Veterans are allowed as much training as is required to restore their ability to work, up to a limit of four years. The VA pays all training costs and, in addition, provides disabled trainees with a monthly subsistence allowance ranging from $65 to $120, based on type of training and number of dependents. Vocational counseling by the VA is mandatory for these veterans, to help them arrive at a suitable objective in life.

Vocational training also was available to World War II disabled veterans under a program that ended for nearly all of them on July 25, 1956. More than 610,000 disabled World War II veterans had received training; a VA study disclosed that 95 per cent were at work, and that nearly all were using skills acquired during training.

GI loans: Veterans of World War II and Korea may qualify for VA-guaranteed or insured loans to purchase homes, farms, or businesses. Under the GI loan program, the VA may guarantee up to 60 per cent of a home loan, with a maximum guaranty of $7,500. The maximum for other real-estate loans is 50 per cent, up to $4,000. For nonreal-estate loans, the top guarantee is 50 per cent, up to $2,000. Loans generally are made by private lenders, although in certain parts of the country the VA is authorized to make a limited number of direct government loans for home-buying veterans.

GI insurance: The VA administers three programs of GI insurance for veterans: U.S. Government Life, for World War I veterans; National Service Life, for World War II veterans; and special programs of nonparticipating insurance for Korea veterans. Veterans who hold GI insurance may keep it in force by paying low-cost premiums. Generally, however, the law prohibits new policies being granted to applicants. The single exception applies to service-disabled Korea veterans. Such veterans are allowed up to one year, following a VA ruling of service-connection, to obtain GI insurance coverage.

Compensation and pensions: Veterans with service-connected disabilities may qualify for monthly VA compensation payments ranging from $17 to $181, depending upon the degree of disability. For certain severe disabilities, such as blindness or loss of limb, additional payments may be made, bringing the total amount of what a veteran could receive up to $420 a month.

World War I, World War II, and Korea veterans also may be entitled to monthly VA pension payments, if they are totally and permanently disabled from conditions not caused by military service, and if their yearly incomes fall below $1,400 a year without dependents or $2,700 with dependents. The monthly pension rate is $66.15, which is increased to $78.75 after 10 years or when the veteran reaches age 65. The rate for veterans in need of constant aid and attendance is $135.45 a month.

Death Benefits: Two forms of payments to survivors of veterans who died as a result of military service have been provided by law. If the death occurred prior to Jan. 1, 1957, families of deceased veterans may qualify for death compension payments. If death occurred after that date, payments will be made under a Survivor Benefits Act and will be based partly on the military rank held by the veteran before his death. For deaths not due to service-connected conditions, survivors under certain circumstances may be entitled to monthly pension payments.

War Orphans Education: Sons and daughters of war veterans who died of service-connected conditions may be entitled to up to 36 months of schooling, mainly at the college level, with VA paying an allowance of up to $110 for each month in school. Such students generally must be between 18 and 23 years of age.

Other Benefits: The VA administers a number of other benefits for veterans. Among them are programs of government grants for "wheelchair homes" for veterans who lost the use of their legs; other grants for automobiles for those who lost their limbs; a contact service to advise veterans of their benefits, and others.

Veterans of Foreign Wars (*vĕt′ẽr-ạnz ŏf fôr′ĕn wạrz*), a fraternal and patriotic organization of men who have been in the armed service of the U.S. in foreign campaigns. The V.F.W. was established in 1913 as a national association into which were merged three previously established regional groups: the American Veterans of Foreign Service, in Ohio, the Colorado Society of the Army of the Philippines, each chartered in 1899, and the American Veterans of Foreign Service, in Pennsylvania, chartered at about the same time. Membership in the V.F.W. is extended to any officer or enlisted man, or any honorably discharged officer or enlisted man whose foreign service in the Army, Navy, or Marine Corps has qualified him to receive the award of a campaign medal or badge from the U.S. government. Veterans of the Spanish-American War, of every armed campaign and expedition in which there has been American participation since then, and of World Wars I and II, comprise the membership, estimated at 1,200,000, in the organization's *ca.* 10,000 posts. In addition, women relatives of members are organized in 4,500 ladies' auxiliary units. The posts, or local units, are scattered throughout the 48 states, the District of Columbia, the Canal Zone, and Hawaii. The local units are supervised by departments in each state or territory, which, in turn, are coordinated in a national headquarters with offices in Kansas City, Mo., and Washington, D.C. The V.F.W. conducts a militant Americanism program in support of the Constitution of the U.S. and furthers American ideals of patriotism and democracy. It aims to encourage comradeship among veterans and helps its members to obtain financial, legal, and medical assistance, provides for veterans' widows and orphans, and conducts community welfare and recreational projects. The emblem of the V.F.W. is the Cross of Malta.

Veterinary Medicine (*vĕt′ẽr-ĭ-nĕr-ȳ mĕd′ĭ-sĭn*), that branch of the medical sciences which deals with the prevention, control, and treatment of animal diseases and with the sanitary inspection of foods obtained from animals for human consumption. With respect to their work on diseases of animals, veterinarians are concerned primarily with domesticated species, including poultry, although some also are skilled in the care of wildlife and fur-bearing animals. Because many of the diseases common to animals can be transmitted to man, veterinarians work closely with doctors of human medicine to protect public health. As regards their work with foods, large numbers of veterinarians throughout the world are engaged by government agencies and private industries to handle the hygienic control and inspection of meats, dairy and poultry products, and other types of food, for the purpose of detecting deficiencies in sanitation and diseases of animal origin that might imperil human health.

Though the practice of veterinary medicine and surgery, in a crude form, is known to have started with the domestication of animals, the first authentic record of animal physicians was found in the laws of Assyria, as laid down by Hammurabi in 2200 B.C. The first author of the Christian era to devote a work exclusively to veterinary medicine was Vegetius (*ca.* 450-500 A.D.). Theories on animal ailments were expounded by other writers on through the centuries, and it was the composite of these writings, some of which were conflicting and misleading, which led to the development of veterinary medicine as a true science.

For all practical purposes, the beginning of formal veterinary education was the beginning of the veterinary profession as it is known today. Before the start of veterinary teaching in institutions of higher learning, almost any interested person could call himself an animal doctor and, without further qualification, administer the art of healing as he conceived it, often with inhumane and disastrous results.

To Claude Bourgelat (1712-79) is due the credit for founding the first veterinary school, in August 1761, at Lyon, France. The school opened on Jan. 1, 1762, as a part of the public educational system of France. For many years before that, however, Bourgelat had independently conducted a private veterinary school. Vienna founded a school in 1775 which became a world leader in veterinary education. Other schools were established at Hanover in 1778, Dresden in 1780, Milan in 1789, and Berlin in 1792. England established its first veterinary school in 1791 at London. In America, the first legally authorized veterinary school was the Philadelphia Veterinary Coll., founded in 1852. Canada, in 1862, opened the Toronto Veterinary Coll., later renamed the Ontario Veterinary Coll. Veterinary schools were likewise established in all of the other leading countries of the world.

Veterinary education in the U.S. was maintained principally by private institutions until about the end of World War I. After that war, all instruction of veterinary students was delegated to schools supported by public funds. With the transition from private management to state-directed colleges and universities, and with the increasingly rigid requirements imposed by these institutions on veterinary matriculants, the scientific standing of the profession was gradually raised. Today, the practice of this branch of medicine ranks equally in prestige and importance with the other learned professions. Practice by empirics and quacks has largely been eliminated, due to licensing and practice laws, keyed to the highest standards of education and enforced by most of the states.

Although veterinary scientists are now able to control and treat most of the serious animal plagues, much still remains to be done toward educating livestock producers the world over in scientific preventive measures. Poor management, lack of knowledge about sanitation, hygiene, and feeding, and sometimes "calling the doctor too late" are paramount reasons for present high livestock and poultry losses—preventable losses.

Today, the U.S. is considered the world's safest place to raise livestock, but it has not always enjoyed that status. There are records of plagues destroying American livestock during the 18th century, and no doubt there were widespread epizootics before then. By the end of the Civil War, animal diseases were so prevalent, and so little was being done to check them, that national attention was awakened. In 1875, the country's annual loss from disease and neglect of livestock was estimated as high as $100,000,000. To protect their own animals from these diseases, foreign nations began to close their markets to American animals and animal products. Veterinarians individually could do little to alter the situation because the maladies were too widespread.

In order to remedy this situation the Bureau of Animal Industry, a veterinary agency, was established in the U.S. Department of Agriculture in 1884. This agency developed methods for eradicating or controlling the major animal diseases, and it helped livestock producers to a better understanding of animal health and management. Outstanding among its many achievements since 1884 are the nation-wide eradication of bovine tuberculosis and of tick fever in cattle. Meat inspection in Federally inspected packing plants became another of the bureau's important functions—a function that goes under the label of "Inspected and Passed—U.S. Department of Agriculture."

In North America, policy-making for the profession and integration of its various branches and interests are effected through the American Veterinary Medical Assn., established in 1863. England has a similar though much smaller national organization, the Royal Coll. of Veterinary Surgeons, founded in 1844. The counterpart of these national groups is found in other countries.

Under educational standards drawn up by the American Veterinary Medical Assn., schools offering courses leading to a degree in veterinary medicine must meet and maintain prescribed levels of efficiency in order to be recognized by the association. At present, the association recognizes 19 such schools, 17 of which are in the U.S. and two in Canada. At least one year of pre-veterinary training is required for entrance to these schools, followed by four years of professional study to qualify for a degree. Such schools also offer training leading to advanced degrees. In this connection, the American Veterinary Medical Assn., through its Research Council, maintains a fund supported solely by private donations to finance fellowships for promising young veterinary scientists and to finance research projects in animal diseases.

In order to give fundamental instruction in animal physiology and hygiene to students of animal husbandry and agriculture, veterinary science departments are operated in virtually all of the state agricultural colleges and state universities, though the courses given by these departments do not lead to a degree in veterinary medicine. Such departments also conduct research work in animal diseases, under state grants.

There are approximately 13,500 graduate veterinarians in the U.S. About two-thirds of them are engaged in private practice and, among these, the general type of practice, covering all species, attracts the greater number. Many, however, restrict their practice to large animals, such as food-producing and work animals, while others, particularly in metropolitan areas, devote their entire time to the care of pets. Still others specialize in the care of only one species, as cattle, or of one class, as zoo or circus animals.

The remaining third hold positions with Federal, state, and local government agencies, with commercial concerns, and with educational institutions. Among the government agencies, the Bureau of Animal Industry of the U.S. Department of Agriculture employs the greatest number (about 1,300), to carry on national disease-control work and meat inspection in Federally inspected packing plants. The Veterinary Corps of the U.S. Army is, in peacetime, the second largest government user of veterinarians, its members being commissioned officers ranking from first lieutenant to colonel who supervise the medical care of army animals and inspect all of the foods of animal origin supplied to troops. During World War II, the corps used approximately 2,200 veterinary officers, most of whom were drawn temporarily from civilian life. State government positions for veterinarians include service with bureaus of animal industry, agricultural experiment stations, extension services, and health departments. Municipal health departments also employ veterinarians, especially in connection with milk control.

Utilization of veterinary services in other countries is dependent largely upon the extent, and degree of perfection, of livestock farming and food processing, and upon the available number of qualified veterinarians. In the British Isles, Canada, Australia, France, and many other European nations, the distribution of veterinarians in the various fields of government and private work is about the same as in the U.S. In countries where the number of veterinarians is extremely small, as in China, most are employed by the government because private practice is not lucrative.

In nations whose livestock population was ravaged during World War II, Allied military government organizations are making every effort to salvage or reconstruct animal industry. To this end, veterinary officers of the U.S. Army and veterinary officials of the U.S. Department of Agriculture are doing outstanding work in helping these countries build new, healthy animal populations.

Veto Power (*vē'tō pou'ẽr*), an authority held by the highest governmental executive to prohibit the enactment of laws proposed and passed by a legislature. The exercise of the veto power originated in ancient Rome. In modern times, the veto as an important part of the legislative process was first used in England. In the 15th century, the House of Commons, which was not empowered to enact laws, presented petitions to the king for the creation of proposed laws. The king either gave or withheld his consent. The veto in American government is a modified form of this early English legislative practice. In England and in other constitutional monarchies, the broadened responsibility of the prime minister and the cabinet has made a royal veto of almost no weight.

In the early American colonies, the absolute veto was vigorously exercised by the royal governor. When the Constitutional Convention was held in 1787, the colonial delegates decided upon a qualified executive veto which would make it possible to pass some laws without gubernatorial approval. Section 7, Article I of the Constitution describes the veto process. All legislative bills, orders, resolutions, and votes which require concurrence of both Houses must be sent to the President. However, the vote to adjourn need not be approved. In practice, Presidential approval is not necessary for Constitutional amendments proposed by the legislature. A bill automatically becomes law if it is neither approved nor disapproved within 10 days after it has been sent to the President, provided Congress is still in session at the end of the 10 days. The President can veto a bill by not signing it, when he knows that Congress will adjourn before the 10-day period is over. This passive exercise of the veto power is known as the *pocket veto.* The Constitution makes it possible for the legislature to override a Presidential veto. The House in which the vetoed bill originated can vote on it again, and if there is a two-thirds vote in favor of it, it can be sent to the other House where it must also receive support by two-thirds of the members. With the two-thirds agreement in both Houses, the vetoed bill becomes law without going to the President a second time.

Viaduct (*vī'ȧ-dŭkt*), a structure for carrying a road across a deep valley or a ravine, differing from a bridge in that the piers are the most prominent features in its construction. Formerly viaducts were made largely of wood or stone, but now they are constructed chiefly of iron, steel, or concrete. In most cases heavy foundations are made of concrete or stone, upon which the piers of steel rest, and the stringers are likewise of steel. Several short spans usually make up a viaduct and the piers are shaped in the form of towers. The longest viaduct of the present time is the Pulaski Skyway, a 3.4 m. motor highway connecting Jersey City with Newark, N.J., built in 1932. Pittsburgh and Los Angeles also have important recent vehicular viaducts.

Via Mala (*vē′ä mä′lä*), a gorge in Graubünden canton, Switzerland, on the Hinter Rhein, a headstream of the Rhine River. The walls of the gorge range up to 1,600 ft. in height. The Splügen Road, built early in the 19th century, traverses the gorge, partly in tunnels and partly by narrow roadways cut into the rock face. It crosses the gorge several times via bridges as high as 625 ft. above the river.

Viaud (*vyō′*), LOUIS MARIE JULIEN (pen name, PIERRE LOTI), naval officer and author, born in Rochefort, France, Jan. 14, 1850; died in Hendaye, June 10, 1923. Viaud served in the French navy for more than 40 years, reaching the rank of captain. Retired in 1910, he was, however, recalled to active duty during World War I. Most of his books were semiautobiographical, drawn from exotic backgrounds familiar to him from his travels during his naval service. They were notable for their atmosphere of romantic melancholy. His novels included three on Breton subjects: *"Mon Frère Yves"* (1883), *"Pêcheur d'Islande"* (1886)—perhaps his best-known work, and *"Matelot"* (1893). Another group was more concerned with his personal experiences: *"Le Roman d'un enfant"* (1890), *"Prime jeunesse"* (1919), and *"Un Jeune Officier pauvre"* (1923). Among other novels, one of the best, and his first published work, was "Aziyadé" (1879), which was set in Turkey. Viaud also wrote travel books, and his son edited his diaries.

Viburnum (*vī-bûr′nŭm*), a genus of some 120 species of shrubs or small trees in the honeysuckle family. Many are cultivated for their flowers, which usually grow in terminal clusters; and others are prized for their fruits, which are dry, or fleshy, one-seeded drupes. Some of the shrubs are evergreens; others are deciduous, with highly colored autumn foliage. Most of the plants are native to the Northern Hemisphere, and many are found in the northern U.S. Among the North American species is the highbush-cranberry, which yields a scarlet fruit used in jelly and preserves. The snowball tree, or guelder rose, a variety of the European cranberry bush, is grown in gardens for its ball-like clusters of white flowers.

Vicar (*vĭk′ẽr*), in ecclesiastical usage, a deputy. In the Protestant Episcopal Church, a vicar is the priest of a dependent chapel; in the Church of England, he is the priest of a parish the revenues of which belong partly to another person or corporation. In the Roman Catholic Church, there are several positions whose titles include the term vicar, for instance, the vicar general, who acts as the deputy of a bishop in the government of the diocese but cannot exercise purely episcopal functions. The pope is considered the vicar of Christ on earth.

Vicente (*vē-sän′tẹ*), GIL, dramatist, born *ca.* 1465; died *ca.* 1536. Little is known of his early life except that he was trained as a goldsmith. After 1502, however, he became known as a court playwright to the Portuguese kings Manuel I and John III. His works were original and of great influence in Portuguese and Spanish drama. Written in verse and in Spanish or Portuguese or both, they include *autos* (religious plays, originally based on Biblical themes), such as the *"Auto da Alma"* (1518) and *"Auto da Feira"* (1528); so-called tragicomedies, such as "Dom Duardos" (1525), the *"Templo de Apolo"* (1526), and "Amadís de Gaula" (1533); and many comedies and farces. The first edition of his plays was published in 1562.

Vicenza (*vē-chĕn′tsä*), a city in Italy, capital of Vicenza Province (area, 1,051 sq. m.; pop., 1957 est., 612,265), on the Bacchiglione River, *ca.* 40 m. N.W. of Venice. It is surrounded by an agricultural region and is a transportation and industrial center, with manufactures of iron and steel products, machinery, and woolen and leather goods. It is the site of notable churches, including the 12th-century cathedral, and is the birthplace of the architect Andrea Palladio (*q.v.*), who designed many of its best buildings. Vicenza was a colony of ancient Rome. In the 12th century it belonged to the Lombard League, and in 1404 it became subject to Venice. It was an Austrian possession from 1797 until its union (1866) with the kingdom of Italy. Population, 1957 (est.), 87,856.

Vice President (*vīs prĕz′ĭ-dẹnt*), the second-ranking elective officer of an organization, following the president (*q.v.*). In the U.S., the Vice President is elected at the same time, in the same way, and for the same term as the President and must have the same qualifications. The office of the Vice Presidency has no executive functions and historically has had little prestige. In the administration of President Dwight D. Eisenhower, however, it grew significantly in responsibility and authority. The Vice President is the presiding officer of the Senate, but he casts no vote except in case of a tie. According to the Constitution, he becomes President in the event of the incumbent President's removal from office, death, resignation, or inability to discharge the duties of the office. Vice Presidents of the U.S. who have succeeded to the Presidency include John Tyler (1841), Millard Fillmore (1850), Andrew Johnson (1865), Chester A. Arthur (1881), Theodore Roosevelt (1901), Calvin Coolidge (1923), and Harry S. Truman (1945). Coolidge, Roosevelt, and Truman were subsequently elected to the Presidency.

Vichy (*vē-shē′*), a town in France, in the department of Allier, about 100 m. N.W. of Lyons. It is located on the Allier River and is surrounded by picturesque hills covered with vineyards and orchards. Vichy is noted for its numerous mineral springs, whose waters are strongly impregnated with various saline substances. The waters are bottled and sold in the market. Baths are maintained at the hotels for the accommodation of visitors. Soda is the leading constituent of the water, which ranges in temperature from 40° to 115° F. Persons suffering from indigestion, gout, chronic catarrh, and other ailments find the application of the water of lasting benefit. *Vichy water* is the name also used for an artificially made mineral water. The value of these springs was known to the Romans. Many remains of marble baths dating from Roman occupation have been found in the vicinity.

Following the fall of France (June 1940) during World War II, Vichy was the seat of the authoritarian French government under Marshal Pétain (*q.v.*) until the summer of 1944, when France was liberated by the Allies and the members of Pétain's government fled to Germany. Population, *ca.* 25,000.

Vickery (*vĭk′ẽr-y̆*), HOWARD LEROY, naval officer, born Apr. 20, 1892, in Bellevue, O.; died Mar. 21, 1946, in Palm Springs, Cal. Educated at the U.S. Naval Acad. and at the Massachusetts Inst. of Technology, he rose through the grades to the rank of vice admiral in 1944. He was loaned to the government of Haiti in 1925 for work in that government's Supply and Transportation Division and after his return to the U.S. in 1928 became head of a division of the Bureau of Construction and Repair of the Navy. He served in the Philippines from 1929-33 as technical adviser on shipping and from 1934-37 in the War Plan Section of the Navy's Bureau of Construction and Repair. Appointed vice chairman of the U.S. Maritime Commission, he became in 1942 responsible for the supervision of all shipbuilding. Under his leadership the shipbuilding industry set annual construction records previously considered impossible of achievement.

Vicksburg (*vĭks′bûrg*), county seat of Warren County, Mississippi. Situated on high bluffs overlooking the Yazoo and Mississippi Rivers, the city lies midway between Memphis and New Orleans. It is served by the Illinois Central R.R. as well as by river steamers. Vicksburg is one of the principal shipping centers of the Mississippi River, and trades in manufactured products, including cottonseed oil, oil cake, machinery, textiles, lumber, and auto trailers. It is the seat of a cotton-producing area that supports gins, compresses, and warehouses. The city is the home of the U.S. Waterways Experiment Station and the Mississippi River Commission. Vicksburg National Military Park, comprising the battle area of the siege and defense of Vicksburg, surrounds the city on the landward side.

The city played an important role during the Civil War, being the only strongly fortified position on the Mississippi River held by the Confederacy. On July 4, 1863, after a prolonged siege, the city surrendered to Gen. Grant. Because the city fell on that date it was not until 1945 that Vicksburg joined the rest of the nation in celebrating the anniversary of the signing of the Declaration of Independence.

The first permanent settlement was made in 1812 by a Methodist preacher, Newitt Vick, for whom the city is named. Vicksburg was incorporated in 1825 and chartered as a city in 1836. Population, 1940, 24,460; in 1950, 27,948. See *Vicksburg Campaign.*

Vicksburg Campaign (*vĭks′bûrg kăm-pān′*), the name of a series of operations in the American Civil War, the purpose of which was to capture Vicksburg, Miss., and ultimately secure control of the Mississippi. In December 1862, Gen. Grant, aided by Gen. Sherman, began the campaign with an army of 48,000 men. The former advanced against the city by land, and Gen. Sherman descended the river, but Sherman was repulsed at Chickasaw Bluffs on the 29th. After this temporary defeat, the campaign was abandoned until January 1863, when Gen. Sherman proceeded to attack the Confederates at Haines's Bluff, while McPherson and McClernand planned to cross the river from the west side under protection of the gunboats under Com. Porter.

A preliminary victory was won by the Federals at Port Gibson in April and as a result the lines of the Confederates were contracted. Grant and Sherman won a victory at Champion Hill and the Big Black River in May, and the Confederates under Pemberton were compelled to retreat into Vicksburg. Grant undertook to capture the city by assault in May, but, failing to do so, he decided to begin a siege. He held a position on the center, while Sherman was on the right and McClernand on the left. Porter held the Federal base of supplies along the Yazoo River. Disease and a lack of supplies made it necessary for Pemberton to surrender, which he did after withstanding the siege for 47 days. The surrender took place on July 4, 1863, the day following the Federal victory at Gettysburg.

Victor Emmanuel II (*vĭk′tẽr ĕ-măn′ū-ĕl*), King of Italy, born in Turin, Mar. 14, 1820; died in Rome, Jan. 9, 1878. He was the eldest son of Charles Albert, King of Sardinia, and received a liberal education under the Jesuits. In 1842 he married the Archduchess Adelaide of Austria. He was a commander in the campaign of 1848-49 and displayed much gallantry at Goito and Novara, defeating the Austrians with considerable loss. His father abdicated after the latter battle, on Mar. 23, 1849, and Victor Emmanuel became King of Sardinia. The Austrians demanded that the

Sardinian constitution granted by his father should be withdrawn, but he insisted upon maintaining it, thus making himself popular with the people of Italy, who came to call him the *Honest King*. He found a wise counselor in Count Cavour, with whose assistance he reorganized the army, regulated the finances, reformed the civil service, and secularized the church property, but for the latter act was excommunicated by the Pope. In 1853 he took part with the European powers against Russia in the Crimean War and in 1859 formed an alliance with France, thus enabling him to renew the contest against Austria.

He commanded in the Battles of Magenta and Solferino and by the Peace of Villafranca added Lombardy to his dominion, but ceded Nice and Savoy to France. Tuscany, Parma, Romagna, and Modena voted to consolidate with Sardinia, and all of Southern Italy was united under Victor Emmanuel when Garibaldi conquered Naples and Sicily. He assumed the title of King of Italy on Mar. 17, 1861. The Peace of Vienna, in 1866, growing out of an alliance with Prussia, caused Austria to cede Venetia. At the outbreak of the Franco-Prussian War of 1870-71 Napoleon was compelled to withdraw the French garrison from Rome, and that city became the capital of United Italy, Florence having been the capital since 1865. Victor Emmanuel entered Rome on July 2, 1871. The epoch of his entire government extended over 29 years, and his reign over United Italy covered a period of eight years. He was succeeded by his son, Humbert I.

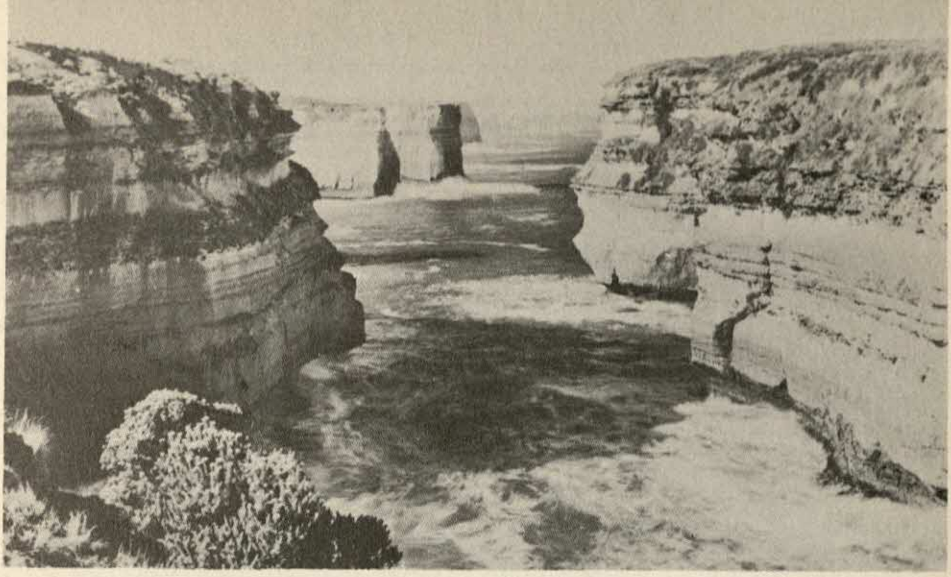
Victor Emmanuel III, King of Italy, born at Naples, Italy, Nov. 11, 1869, only son of King Humbert I and Margherita of Savoy. He was educated at Rome under the direction of Col. Osio, who was thorough in his discipline and in his instruction. In 1889 Victor completed his military education and was given a command in the national division of troops stationed at Naples, where he demonstrated much executive ability as an officer. He married Princess Elena of Montenegro in 1896. In 1900, he ascended the throne of Italy, succeeding his father, Humbert I, who had been assassinated. In his official proclamation, issued immediately after ascending the throne, he expressed the determination to protect the unity and independence of Italy established by Victor Emmanuel II and maintained by Humbert I. As King, Victor Emmanuel improved the discipline of the army and fostered education. In World War I, the king took over active command on the Austrian front. After the armistice (1918), he returned to Rome. During the Fascist regime of Benito Mussolini (*q.v.*) he was little more than a figurehead. In 1936, he was proclaimed Emperor of Ethiopia and, in 1939, became King of Albania, both through invasions ordered by Mussolini. In 1940, he declared war on the Allies. After the power of Fascism was broken with the ousting of Mussolini in 1943, Victor Emmanuel's abdication was demanded, but he refused to leave the throne until Rome fell to the Allies in June 1944. Then he withdrew from all public affairs, appointing Crown Prince Humbert "Lieutenant General of the Realm." He did not actually abdicate until May 9, 1946, when he and his wife went into exile in Egypt where he died, Dec. 28, 1947.

Victoria (*vĭk-tō′rĭ-ȧ*), county seat of Victoria County, Texas, on the Guadalupe River, 95 m. S.E. of San Antonio. It is on the Southern Pacific and the Gulf Coast R.R.'s. Among the principal buildings is Victoria Coll. Among the city's manufactures are cottonseed oil, dairy products, and machinery. Victoria was settled in 1824 and incorporated as a city in 1839. Population, 1950, 16,126.

Victoria, capital city and port of British Columbia, situated at the southern extremity of Vancouver Island on the west coast of Canada. It is served by the Canadian National and Canadian Pacific R.R.'s, the Canadian Pacific Steamship Co., and Trans-Canada Airlines. Greater Victoria, with a population of about 100,000, is divided into the municipalities of Oak Bay, Saanich, and Esquimalt and is sea-girt on the south and east. On the north and west it is surrounded by rich farmlands, yielding small fruits, bulbs, and seeds. Although Victoria is on the same degree of latitude as Paris, the port enjoys a much milder climate, owing to the Japan current which touches its shores. Chief exports are lumber, fresh and canned fish, small fruits, sand and gravel, lime, coal, whale oil, patent roofing, hides, raw furs, woodpulp, and cement. The noteworthy buildings include the Parliament Building, Dunsmuir Castle, St. Andrew's Roman Catholic Cathedral, and Christ Church Anglican Cathedral. Royal Roads Naval Acad., lodged in the building and grounds of Hatley Castle, 10 m. from Victoria, is the only naval academy on the west coast of Canada. Esquimalt, a municipality adjoining Victoria, is the west coast naval base of the Royal Canadian Navy. The city was founded as a fort in 1843 by the Hudson's Bay Co. and was incorporated as the city of Victoria in 1862 in honor of the queen. Population, 1951, 51,331.

Victoria, a state of the Commonwealth of Australia, situated in the southeastern part of the continent. It is bounded on the N. and N.E. by New South Wales, E. by the Tasman Sea, S. by Bass Strait and the Southern Ocean, and W. by South Australia. Bass Strait separates it from Tasmania. The length from east to west is 493 m. and the general width is about 290 m. It has an area of 87,884 sq. m., hence is the smallest of the states on the Continent of Australia.

DESCRIPTION. An irregular range of mountains traverses the state from west to east, forming the



Courtesy Australian News & Information Bureau, N. Y.

VIEW OF THE COAST OF VICTORIA, AUSTRALIA

southern extension of the Great Dividing Range. Most of the surface consists of unwooded plains, and the northwestern part belongs to the region of the Great Plains. The Australian Alps are in the eastern part, from which numerous chains reach out in various directions, and toward the west they merge into the Grampians. Mt. Bogong, height 6,512 ft., and Mt. Feathertop, height 6,306 ft., are the highest peaks of the Australian Alps within the state. Mt. William, height 3,829 ft., is the highest summit of the Grampians. Ranges known as the Pyrenees and the the Hume Range extend in ridges between the Australian Alps and the Grampians. Belts of timber extend along the streams and scattered groups of trees characterize the undulating plain. The varieties of forest trees are very numerous, including the eucalypti or gum trees, she oak, honeysuckle, cherry, acacia, and allied species. In most of the regions that have timber the trees stand widely apart and the surface is quite free from underbrush, thus affording a good growth of grasses.

The drainage belongs to two systems, one sloping toward the south and the other forming a part of the Murray Valley. Most of the streams are short and not navigable. The Murray forms the larger part of the boundary between the state and New South Wales and receives the inflow from the Ovens, Goulburn, and Campaspe and other smaller rivers. Among the streams flowing toward the south are the Mitchell, Tambo, Latrobe, Yarra, and Wannon. Port Philip Bay, with an area of 870 sq. m., is an important inlet from Bass Strait. Victoria's largest lakes are Lake Corangamite in the western district and the Gippsland Lakes in the east.

Though sudden atmospheric changes occur, the climate is generally healthful and agreeable. The extremes of temperature range from 32° to 110° and the annual average is about 58°. January is the warmest and July the coldest month. Ice sometimes forms in the coldest part of July, but it disappears before the sun reaches the meridian. The year may be divided into two seasons, the hot, dry season, extending from October to March, and the moist, cool season, from April to September. Rainfall is heaviest in the eastern part, where it is from 30 to 50 in., but it decreases gradually toward the northwest, where it does not exceed 10 to 14 in. Droughts are not infrequent in this section.

MINING. The state has extensive deposits of minerals, especially gold. Granite, iron, coal, copper, tin, lead, and zinc are obtained in considerable quantities. Precious stones of much value occur in the mountains, especially garnet, ruby, agate, topaz, and sapphire. Mining is conducted by modern methods chiefly with machinery and British capital, and the exports are extensive.

AGRICULTURE. Farming is a more extensive enterprise in Victoria than in any other state of the commonwealth. This is due to the fact that the rainfall in the southern and eastern parts is normally certain and that a large portion of Victoria has soil of much fertility. Wheat is grown on nearly half of the cultivated land and is the leading crop. Oats are second in importance. Both oats and wheat are raised to some extent for hay, and, when grown for that purpose, they are cut green. Other farm products include barley, rye, vegetables, and fruits. Grapes are cultivated extensively, yielding large quantities of the finer species. The sheep and wool industry plays a large role and large interests are vested in rearing cattle and horses. Other domestic animals include mules, swine, goats, and poultry.

Manufactures. Manufacturing enterprises were retarded in their development to some extent by the profitable investments in mining and farming, but they are now in a state of healthful growth. Expansion of secondary industry during and since World War II has been rapid. Many of the industries are connected with the mines, especially smelting and machine shops. Other enterprises include flour and grist mills, clothing and textile factories, potteries and brickyards, vintages, breweries, metal works, creameries, and cheese factories; these are chiefly for domestic consumption. The fisheries furnish considerable material for curing and canning. Large quantities of fruit are canned for exportation. Among the general manufactures are saddlery, hardware, cigars, preserved meats, and utensils.

Transportation. The state has about 4,750 m. of railroads in operation, and electric railways are operated in the larger cities and many of the rural districts. The greater part of the railroads are owned and operated by the government under a commissioner. Most of the lines are in the central part of the state, but the system is connected with those of New South Wales and South Australia. The trade is largely with Great Britain, but considerable foreign trade is carried on with other nations as well. Among the exports are wheat, wool, gold, dried fruits, butter and cheese, livestock, hides, and preserved meats. The imports consist chiefly of clothing, machinery, and metal wares. In the volume of trade, Victoria ranks next to New South Wales. Melbourne and Geelong, both on Port Philip Bay, are the leading ports.

Government. The state has a government similar to that of the other members of the commonwealth. Its chief executive is a governor appointed by the British crown. Legislative authority is vested in the Parliament, which consists of a legislative council and a legislative assembly. The former has 34 members elected for six years, and the latter has 65 members elected for three years. A property qualification is required to permit voting for members of the upper house, but such is not the case when voting for members of the assembly. Both male and female adults vote. Local government is administered in subdivisions corresponding to the towns and counties of Canada. The government has fostered the extension of transportation facilities and encouraged the development of industries.

Education. Elementary and secondary schools are maintained under the direction of the state. Attendance in school is compulsory and free between the ages of 6 and 14 years. Practically all the adult population above the age of 15 is able to read and write. A large part of secondary instruction is in the hands of private and denominational interests. Melbourne has a fine university, dating from 1855, with which are connected a museum, a library, an observatory, and zoological and botanical gardens. Other higher institutions include several colleges, normal schools, technical institutes, schools of agriculture and horticulture, and schools of mines.

History. Capt. Cook first sighted the coast at a point near Cape Everard in 1770 and George Bass made explorations in 1797, discovering Bass Strait. Lieutenant Murray took possession of Port Philip Bay in 1802. The first permanent settlement was made by the Henty family on Portland Bay in 1834, after which whale fishing and sheep raising began to develop. The region was incorporated with New South Wales in 1835 and was formally opened for settlement the following year. Melbourne was laid out in 1837 and soon developed trade with the interior. The area was separated from New South Wales in 1850 and the colony of Victoria was organized the following year.

A large number of immigrants came to the colony in 1851, when gold was discovered. Within 10 years the population increased to 540,322. Melbourne became a city in 1856 and soon had a large interior and foreign trade, while Geelong, on the opposite side of Port Philip Bay, became an important trade center. The colony rapidly developed its agricultural, mining, and stock-raising interests, making it the most prosperous and densely populated of the Australian provinces. With the building of railroads to all sections and the navigation of the Lower Murray, settlements and trade were carried to the interior. The people ratified the Federal constitution by a large majority in 1898.

Population. The inhabitants are largely Australian-born. There are also Europeans, New Zealanders, and others. About three-fourths of the people are Protestants. Among the leading denominations are the Anglican, Roman Catholic, Presbyterian, and Methodist churches. Melbourne (pop., 1956, 1,649,000), in south central Australia, is the capital of Victoria and the second-largest city of Australia. Other cities include Ballarat, Bendigo, and Geelong. Population, 1958 (est.), 2,770,919.

Victoria, the Roman goddess of victory, corresponding to the Greek goddess Nike (*q.v.*). For an illustration of the Greek concept of the goddess, see *Winged Victory*.

Victoria, a genus of plants that resembles the common water lily, so named in honor of Queen Victoria. A species known as *Victoria regia* is the largest of the water lilies. The leaves of this plant are nearly round and have a diameter of 5 or 6 ft., floating on the surface of the water, and the flowers are about 14 in. in diameter. These flowers are quite fragrant, have a rose color, and appear among the leaves upon prickly stalks. Several species are found in the northeastern part of South America, especially in the swamps and lagoons lying between the Amazon and the Orinoco. They have been brought to Europe and North America for cultivation in hothouses, where they are admired for their large size.

Victoria I, ALEXANDRA, Queen of Great Britain and Ireland and Empress of India, born at Kensington Palace, May 24, 1819; died Jan. 22, 1901. Granddaughter of George III, she was the only child of the Duke of Kent and Louisa Victoria, Princess of Saxe-Coburg-Saalfeld. Her father died in 1820, when she was but eight months old, and her education was left to her mother, who trusted her to the Duchess of Northumberland for instruction. She succeeded her uncle, William IV, on June 20, 1837, as Victoria I, and was crowned at Westminster in 1838. Victoria was the sixth sovereign of the house of Hanover. On Feb. 10, 1840, she married Prince Albert, of the German house of Saxe-Coburg-Gotha, who was descended from King Wettin, the founder of the house of Saxe-Coburg-Gotha and contemporary of Charlemagne. This union was an unusually happy one. The royal couple had four sons and five daughters. The nine children were: *Victoria,* married in 1858 to Frederick William of Germany, died in 1901; *Albert Edward* (Edward VII), married in 1863 to Alexandra of Denmark, died in 1910; *Alice,* married in 1862 to Prince Frederick William of Hesse, died in 1878; *Alfred,* married in 1874 to Marie of Russia, died in 1901; *Helena,* married in 1866 to Prince Christian of Denmark; *Louisa,* married in 1871 to the Marquis of Lorne; *Arthur,* married in 1879 to Princess Louise Marguerite of Prussia; *Leopold,* married in 1882 to Princess Helena of Waldeck, died in 1884; and *Princess Beatrice,* married in 1885 to Prince Henry of Battenberg.

Lord Melbourne was at the head of the government when Queen Victoria ascended the throne, but he was succeeded in 1841 by Robert Peel. Other leaders of distinguished statesmanship succeeded to the government from time to time, and her entire administration was characterized by wise leaders. Her long reign of 64 years, the longest in England, witnessed notable changes in the history and geography of the world, and within that period Great Britain greatly extended its territory. Though colonial wars were frequent and various disturbances occurred in Ireland, England passed through a comparatively long era of peace, prosperity, and industrial development. The revolutionary period of 1848 had little effect on England, and the queen lived in the time of many important historical events, among them the Civil War of the U.S., the union of the kingdom of Italy, and the rise of the German Empire, and the establishment of the French Republic. Among the leading events of her reign were the abolition of the Corn Laws, the adoption of penny postage, the Catholic Emancipation Act, the enfranchisement of the Jews, the Crimean War, the Irish Land Act, the rebellion in India, and more or less important wars in Egypt, Afghanistan, and South Africa.

Courtesy Brown Bros., N. Y.

QUEEN VICTORIA

Her husband died in 1861 and she lived in comparative retirement until 1876, when she again personally attended the opening of Parliament and was proclaimed Empress of India. The life of Victoria stands as an example of piety and devotion, though in governmental matters she exercised little potent influence, leaving the conduct of state affairs largely to her ministers. Although her reign was of longer duration than that of any other English sovereign, it was surpassed by those of a few rulers, Louis XIV of France being a notable example. The 50th year of her reign was celebrated by the British people as a golden jubilee in 1887, and 10 years later they celebrated a "diamond jubilee" with imposing ceremonies. She patronized learning and art and aided in the publication of a number of works. These include: "Early Days of His Royal Highness the Prince Consort," "Leaves from the Journal of Life in the Highlands," and "Life of the Prince Consort." She was succeeded by her son, who assumed the title of Edward VII (*q.v.*). See also *Great Britain.*

Victoria Falls (*vĭk-tō′rĭ-ȧ fạlz*), a great cataract in Rhodesia, South Africa, on the Zambezi River. It is located a few miles below the confluence of the Kwando and the Zambezi, about 225 m. N.W. of Bulawayo. It is wider than Niagara

Falls and more than twice as high. Above the falls the Zambezi flows in a broad basin dotted with islands. It is about a mile wide where the water plunges suddenly into a gorge that cuts some 400 ft. deep into the level of the surrounding plain. Within the chasm, the water thunders and forces its way out through a narrow channel which continues in a tortuous course for *ca.* 40 m. Called Mosioatunya (roaring smoke) by natives, the falls were named for Queen Victoria by David Livingstone (*q.v.*), who discovered them in 1855. Victoria Falls Bridge, highest in the world when built, crosses the river just below the falls, rising 310 ft. above high water level and carrying motor and railroad traffic.

Victoria Nyanza (*vĭk̨-tō′rĭ-ȧ nyän′zä*), or LAKE VICTORIA, a lake in east central Africa, divided among Kenya, Tanganyika, and Uganda. The second-largest fresh-water lake in the world, it has an area of *ca.* 26,800 sq. m. and is *ca.* 3,700 ft. above sea level. It is not unusually deep, but it has some deep bays. Ukerewe, in the southern portion, is the largest of its many islands. The lake is considered the main reservoir of the Nile River, which issues from it at the north at Ripon Falls. Fish are plentiful and there are extensive forests and an abundance of wild life in the vicinity. The major port for steamboat traffic on the lake is Kisumu, Kenya, which is linked by rail with the Indian Ocean. John H. Speke (*q.v.*) discovered Victoria Nyanza in 1858 and Sir Henry Morton Stanley (*q.v.*) explored it in 1875. In World War I it was the scene of hostilities between British and German forces, and the British occupied Ukerewe Island (1916).

Victoria Regia (*vĭk̨-tō′rĭ-ȧ rē′gĭą*). See *Victoria.*

Victory Garden (*vĭk̨′tô-rў̆ gär′dęn*). See *Agriculture:* VICTORY GARDEN.

Victory Ship (*shĭp*), see *Ship;* and color plate *Merchant Vessels Through the Centuries,* Vol. XI.

Victory Tax (*tăk̨s*). See *Income Tax.*

Vicuña (*vĭ-k̨o͞on-yą*), an animal related to the llama (*q.v.*), found high in the Andes Mts. of Ecuador, Peru, and Bolivia. It exists both in a domestic and a wild state, roaming naturally in small herds consisting of one male and 6 to 12 females. One of the smallest of the llama's relatives, it measures *ca.* 3 ft. high at the shoulders and is fawn-colored with a white underside. Its coat is of fine, lustrous hair which the Incas reserved for weaving royal garments. Vicuña wool is still prized for the particular softness and body it lends to cloth.

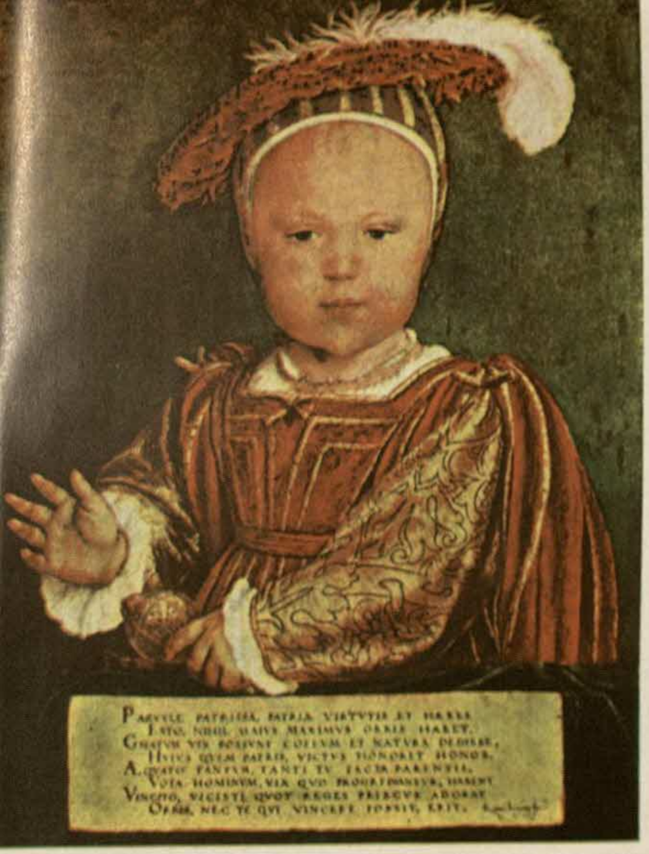
Vienna (*vê-ĕn′ȧ*), in German *Wien,* the capital and largest city of Austria, on the Danube River, near the foothills of the *Wiener Wald,* the eastern extremity of the Alps. It is 330 m. S.E. of Berlin, has a temperate climate and an annual rainfall of 24 in., and is about 562 ft. above the sea. It covers an area of 107 sq. m. The city is the converging center of a large number of important railroads and through it passes the Danube Canal, a branch of the Danube River. Although Vienna contains several medieval structures, it is essentially a modern city, having spacious streets and squares, numerous public parks and handsome modern buildings.

In the center of the city are the principal hotels, many of the embassies and legations, government offices, Hofburg palace and library, and St. Stephen's Cathedral. Alsergund contains the military hospital, the municipal asylum, and a general hospital. Among the larger buildings are the imperial palace, the houses of parliament, the courts of justice, the custom house, and the modern palaces of the nobility. Other noteworthy structures include the city hall, the *Burgtheater,* the municipal library, the Chamber of Commerce, the Opera, and the Albertina, which houses rare art treasures. Schönbrunn, the former imperial residence, is about 2 m. from the city.

Vienna, often compared to Paris, is the intellectual center of Austria. It contains many famous churches, numerous schools, and a fine university. The Vienna Conservatory of Music, the Polytechnic Institution, the Austrian Museum of Art, the Government Gallery of Modern Masters, the Technical Museum of Industry and Manufacturing, the Museum of Sociology and Economics, and the Military Geographical Institute are a few of its cultural centers. The imperial library contains numerous volumes and manuscripts, and affiliated with it is one of the finest museums of Europe. The noted monuments include one dedicated to Schiller, one to Joseph II, one to Goethe, one of Schubert, one of Beethoven, and one of Prince Eugene. Fine specimens of painting by Dürer, Rubens, and other masters are in the picture gallery of the Belvedere Palace, formerly a residence of Prince Eugene.

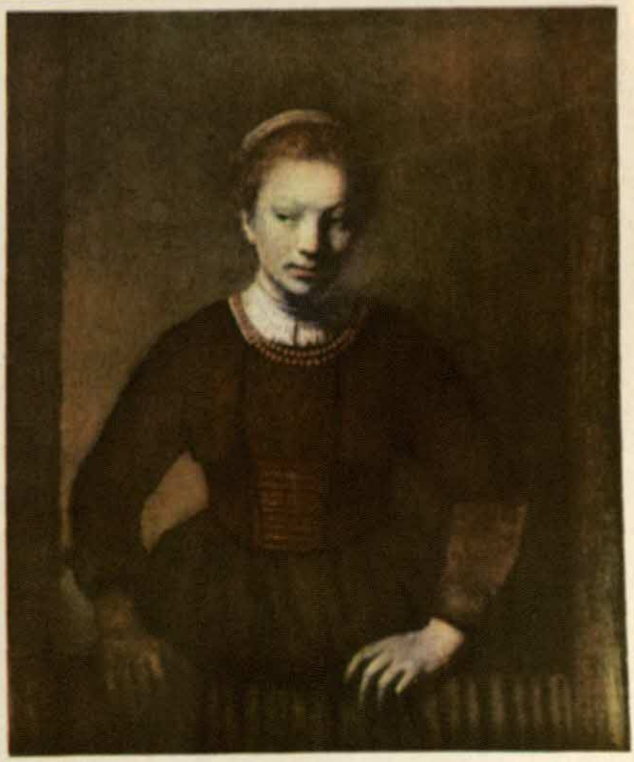
The musical capital of Europe in the 19th century, Vienna of the Austro-Hungarian Empire was a symbol of gaiety and charm, home of the beloved Strauss waltzes, of colorful shops and gay fashions. Vienna was not only the center of art and education in Austria, but of its manufacturing and commerce as well. The extensive system of railways and navigation on the Danube facilitated a large interior and export trade. Among the manufactures are leather, soap, textiles, paper, woolens, chemicals, clothing, books, musical instruments, embroidery, porcelain, firearms, machinery, boilers and engines. Meerschaum pipes, musical instruments, and bent-wood furniture made in Vienna were exported in large quantities.

The site occupied by Vienna was originally a part of the Celtic settlements of Europe. A mili-



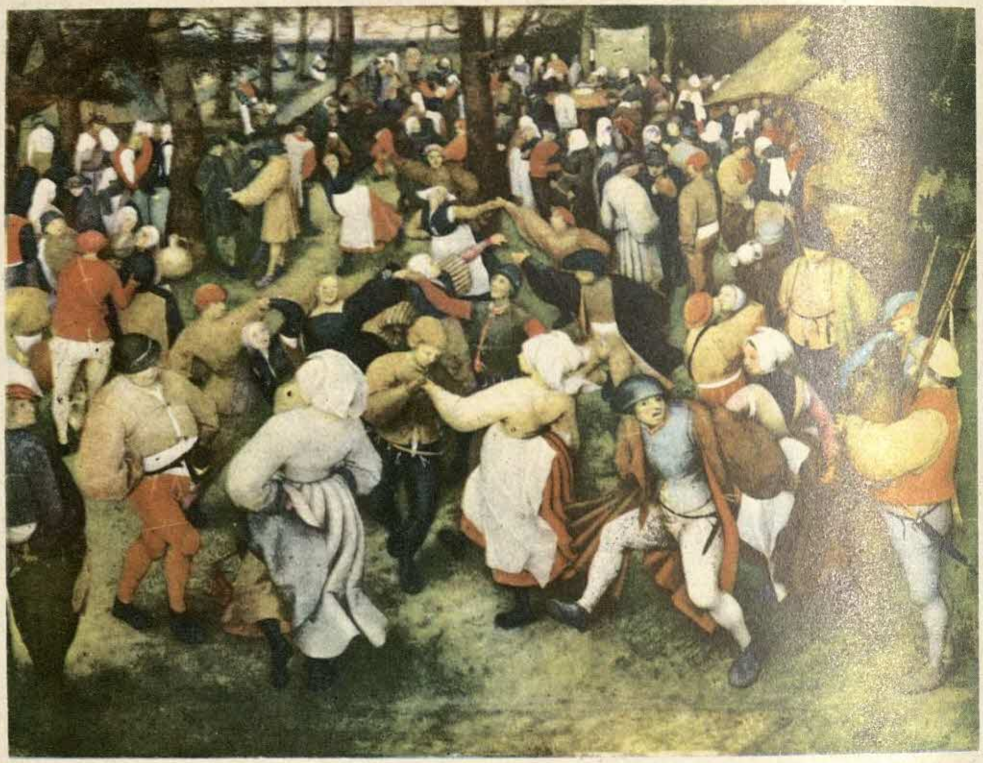
EDWARD VI
AS PRINCE OF WALES

HANS HOLBEIN, The Younger
(German, 16th century)

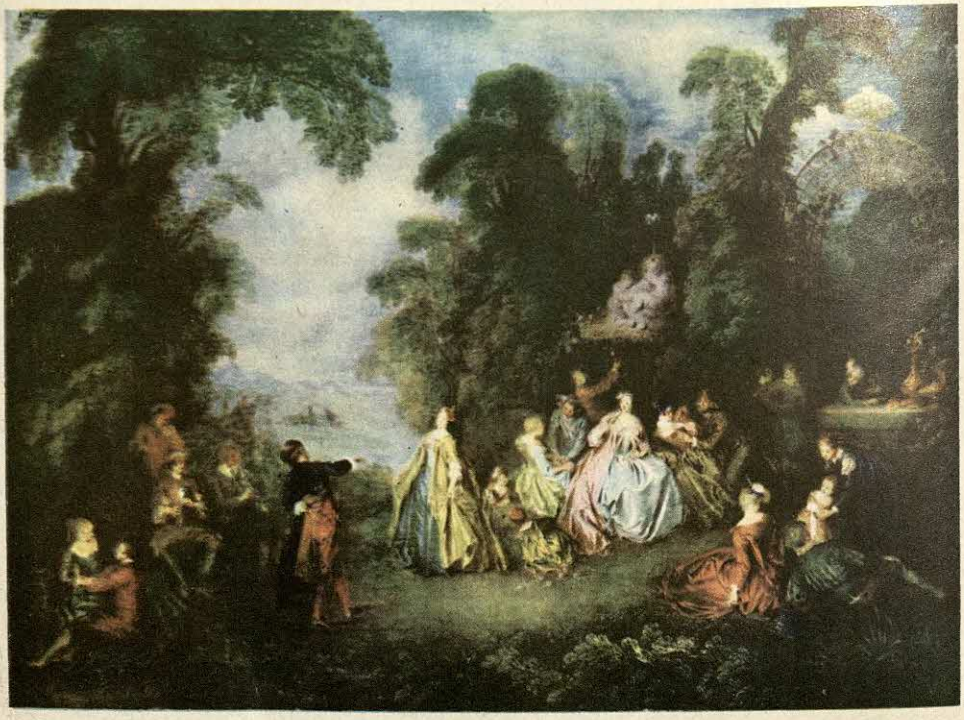


YOUNG GIRL AT AN
OPEN HALF DOOR

REMBRANDT VAN RIJN
(Dutch, 17th century)



THE WEDDING DANCE PIETER BREUGHEL, The Elder (Flemish, 16th century)



THE DANCE JEAN BAPTISTE PATER (French, 18th century)

S.C.E.R.T., West Bengal
Date ....
Acc. No. ....
4978
4740

Courtesy Ewing Galloway, N. Y.

ST. STEPHEN'S CATHEDRAL IN VIENNA

Pre-World War II photograph

tary post, called Vindobona, was established here by the Romans, and Marcus Aurelius died here in 180. When the barbaric tribes occupied the territory of ancient Rome, it was taken by the Huns under Attila. Its growth dates from the time of the Crusades, when it became a trade center. The Hapsburgs made it their capital in 1276 and in 1477 the Hungarians besieged it unsuccessfully. It was defended successfully against the Turks under Sultan Solyman the Magnificent in 1529 and again in 1683. Under Ferdinand I it became the seat of the German emperors. The Congress of Vienna assembled here on Nov. 1, 1814, to organize the affairs of Europe after the first overthrow of Napoleon, but his escape from Elba, in 1815, broke up the conference, although its acts were formally sanctioned by the powers on June 9, 1815. Vienna witnessed a revolutionary movement in 1848, ending in bloodshed. Since 1921 a separate province within the republic, Vienna housed the two chambers of the Federal Congress of Austria. The German-inspired *"Anschluss,"* or union movement, supported by Fascist elements in the Austrian government, resulted in strife and the bloody crushing of the Socialists in February 1934 (see *Austria*). In March 1938, German troops marched into Vienna and Adolf Hitler proclaimed the incorporation of Austria into Greater Germany. In World War II, Vienna was the site of fierce fighting between German and Russian forces. On April 13, 1945, it was captured by the 2nd and 3rd Ukrainian Armies. Vienna was occupied by troops of the Big Four powers, under the supervision of an Allied commander, until 1955, after the signing of the Austrian State Treaty. Population, 1951, 1,616,125.

CONGRESS OF VIENNA

Vienna, CONGRESS OF, a convention of the leading nations of Europe, held at Vienna, Austria, in 1814. Called by Prince Metternich (*q.v.*) for the purpose of settling the affairs of Europe after the Napoleonic wars, it convened on Sept. 30. Among the countries represented were Austria, England, France, Prussia, Portugal, Russia, Sweden, and Spain, but representatives were present from all the larger countries except Turkey. The rulers who attended in person included Emperor Francis of Austria, Alexander I of Russia, and Frederick William III of Prussia. Among the chief adjustments of territory included were the annexation of Lombardy and Venice to Austria; the establishment of Belgium and Holland as a kingdom under William I; the annexation of Savoy and Piedmont to the kingdom of Sardinia; the retention of Malta and Helgoland by Great Britain; the retention of Naples by Murat; and the annexation of Swedish Pomerania, a part of Saxony, the Rhine province, and the duchy of Posen to Prussia. Additional provisions included the retention of Norway by Sweden, the unification of Denmark and Lauenburg, and the annexation of the duchy of Warsaw by Russia. In February 1815 Napoleon suddenly escaped from Elba. This caused the congress to disperse immediately, but its provisions were carried out after the fall of Napoleon in that year.

Vienna, UNIVERSITY OF, an institution of higher learning in Vienna, Austria. Founded by Duke Rudolph IV, in 1365, it began to prosper in 1384, when a theological faculty was added. The Jesuits obtained control of it under Ferdinand II, in 1623, and greatly enlarged it by the addition of numerous buildings. It has since enjoyed an eminent position among universities, especially for its college of medicine. The university also has faculties of theology, law, political science, and philosophy.

Viet Nam (*vyĕt näm′*), a republic of southeastern Asia. Viet Nam is bounded on the N. by China, on the E. by the Gulf of Tonkin and the China Sea, on the S. by the Gulf of Siam and the South China Sea, and on the W. by Laos and Cambodia. The area is approximately 123,000 sq. m., and the population 22,600,000 (1949 est.). Saigon (population, *ca.* 700,000 in 1948) is the capital.

The climate of Viet Nam is tropical, and numerous rivers and streams intersect the country. The chief products are rice, rubber, cotton, corn, sugar cane, coffee, tea, tobacco, copra, and raw silk. Agriculture and fishing are the most important industries in South Viet Nam, and large quantities of fish are dried and salted for export. Valuable timber forests abound in Central Viet Nam. Tin, limestone, calamine, copper, zinc, coal, and iron ore are the principal minerals and are mined primarily in Central and North Viet Nam. Cattle raising is of some importance. The method of education in Viet Nam is similar to that of France, and there are numerous secondary schools. A university is located at Hanoi. The principal ports are Haiphong and Saigon.

The name Viet Nam originates from the Indo-Chinese *"Viet Nam Quoc Dan Dang"* meaning "People's Party of the South Country," although "Viet Nam" itself refers to the South Country.

Viet Nam first emerged as an independent state following World War II. Politically, it represented the culmination of strong nationalist factions in Indo-China that had gained power before and during the war. Geographically, the new state centered on the small country of Annam, where insurrectionists had succeeded in overthrowing the emperor, Bao Dai. Under the leadership of Moscow-trained Ho Chi Minh, the movement soon included the neighboring country of Tonkin, and on March 6, 1946, France agreed to the formation of the Republic of Viet Nam (comprising the former countries of Annam and Tonkin) within the French Union. Within a year, however, certain factions under Ho Chi Minh renewed hostilities, finally forcing the French to abandon any hope of a peaceful settlement with Ho Chi Minh. His government retreated to the interior, and from there his forces engaged in a harrassing guerrilla warfare against the French and the Viet Nam nationalists. Consequently, France installed Bao Dai, former emperor of Annam, as chief of state and agreed to support him in a movement to rally the population around a new Vietnamese government. In 1949 the independence of the Bao Dai government (including Annam and Tonkin) within the French Union was recognized by France and most Western nations, and shortly afterward Cochin China voted to become part of Viet Nam. The government of Ho Chi Minh, known as Viet Minh, refused to accept membership in the French Union, and his troops (with the active help of Red China) finally outnumbered and defeated the French and Viet Nam forces in a series of powerful attacks. The civil war ended in a truce, signed at Geneva, Switzerland, in 1954; by its terms, Viet Minh received the northern part of the country (above the 17th parallel—*ca.* 77,000 sq. m.). Viet Nam under the leadership of Ngo Dinh Diem set out to reconstruct the country on a democratic basis. Bao Dai (who was residing in France) was ousted; the country was declared a republic, and in March 1956 a 123-member national assembly was elected to write a new constitution. See also *France; Indo-China.*

Vieuxtemps (*vyē̃-tän̲′*), HENRI, violin virtuoso and composer, born in Verviers, Belgium, Feb. 20, 1820; died in Algeria, June 6, 1881. He began to study the violin when five years of age and in 1833 made a tour of Germany. Later he studied music under Simon Sechter in Vienna. He made successful tours of European cities. At the age of 24, he started on a concert tour to the U.S., and revisited this country in 1857 and in 1870. He became solo violinist to the Czar of Russia in 1846. In 1871 he was made professor of the violin at the Conservatory at Brussels, which position he held until 1873. A paralytic stroke later forced him to devote himself solely to teaching and composing. Among his works, six concertos for violin and orchestra and two for cello and orchestra are still favorites in modern repertoires.

Vigée-Lebrun (*vē-zhā'lē-brûn'*), MARIE ANNE ELIZABETH. See *Lebrun, Marie Anne Elizabeth.*

Vigfusson (*vĭg'fo͞os-sôn*), GUDBRAND, educator and author, born in Frakkanes, Iceland, Mar. 13, 1827; died in Oxford, England, Jan. 31, 1889. After studying at Reykjavik, he attended the Univ. of Copenhagen, and made the Danish capital his residence from 1849 to 1864. In the latter year he went to England, where he busied himself for 10 years on the "Icelandic Dictionary." He was made professor of the Icelandic language and literature at Oxford in 1884, which position he held until his death. His chief writings include: "An Icelandic Reader," "Tunatal," an essay on the chronology of the Icelandic Sagas, and "Sturlunga Saga." These works have been widely translated.

Vigilance Committee (*vĭj'ĭ-lạns*), a term which is used in the U.S. to describe a group of citizens who set themselves up as a judicial body to punish or prevent crime when the due processes of law are allegedly inadequate. Outstanding examples occurred in California during the gold rush days when California was overrun with lawless adventurers in search of gold and no legal government existed there. A group of about 200 citizens (Vigilantes), who were later joined by many others, took it upon themselves to maintain order and they executed a number of thieves and murderers. Similar groups were prevalent throughout the West during the early years of that area's settlement, and in the South during the Reconstruction period when organizations such as the Ku-Klux-Klan (*q.v.*) were founded.

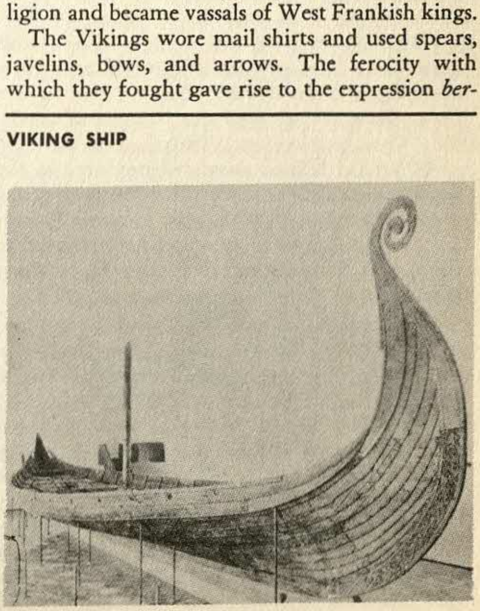
Vigny (*vē-nyē'*), ALFRED DE, poet, born at Loches, France, Mar. 27, 1797; died Sept. 18, 1863. He entered the military service in 1816, but retired after eight years to devote himself to literature. His writings belong to the romantic school. Besides producing a large number of poems, he wrote several novels and dramas. "Chatterton" is his best-known drama and "Cinq-Mars," a historical novel, is considered his best work in prose. Among his most notable poems are: "Eloa" and "Poémes."

Vigo (*vē'gō*), a town in the northwestern part of Spain, in the province of Pontevedra. It is an important seaport and naval station. The harbor is sheltered from the sea by surrounding mountains and by the islands of Cies, at its entrance. Vigo is a fishing center, with considerable foreign trade and a moderate industrial output. The manufactures include flour, paper, lumber, tanning, distilling, petroleum refining, and soap production. Vigo was attacked twice by Sir Francis Drake (in 1585 and 1589), and once by the British in 1719. A combined French and Spanish fleet was annihilated in the bay by British and Dutch forces in 1702. Population, *ca.* 65,000.

Vikings (*vīk'ĭngz*), piratical Norsemen who conducted continuing large-scale raids along the coasts and inland waterways of Northern and Western Europe from the 8th to the 10th century. As pagans, the Vikings (from *vik*, meaning "inlet") set out from the fjords of the Scandinavian coast in fleets of black galleys to fight the power of Christendom, which was sweeping Europe under the leadership of Charlemagne. By the middle of the 9th century they had overrun and settled in parts of Ireland, Western Scotland, and England; in territories along the French rivers Rhône, Garonne, Loire, Seine, and Somme; and in sections of the Rhineland and along the Elbe River in Germany. Two Danish Viking leaders, Godfred and Siegfried, unable to settle their forces in England, took them to the Continent, where some invaded the country of the Rhine River mouth and others went down the Loire into France. One group of raiders reached as far as Spain and the African coast. By the beginning of the 10th century most of the Vikings had been pushed back, although some were absorbed in the regions they occupied, notably in Normandy, where they adopted the Christian religion and became vassals of West Frankish kings.

The Vikings wore mail shirts and used spears, javelins, bows, and arrows. The ferocity with which they fought gave rise to the expression *ber-*

VIKING SHIP



serksgangr (Berserk's way) in Norse literature, from which the modern English term *berserk* is derived. See also *Northmen.*

Vilas (*vī'lạs*), WILLIAM FREEMAN, politician, born in Chelsea, Vt., July 9, 1840; died Aug. 29, 1908. His parents moved to Madison, Wis., in 1851. He studied law, and in the Civil War entered the Union service. In 1863 he resigned to practice law at Madison, and became trustee of the University Law School. He served one term in the Wisconsin legislature. President Cleveland appointed him Postmaster General in 1885, and later made him Secretary of the Interior. He became a member of the U.S. Senate in 1891 and in 1896 supported the single gold standard movement.

Villa (*vē'yä*), FRANCISCO (PANCHO), general, born at Las Nieves, Mexico, in 1877; died in 1923. His real name, *Doroteo Arango,* was dropped in favor of Villa (name of an early bandit leader) when he became chief of a group of rebels in the Madero revolt. Outlawed by the Díaz government, he later figured as one of the most daring leaders of the revolution in Mexico (1910). Involved in subsequent disorders, including the Carranza revolution (1914-15), the revolutionary general withdrew across the American border only to recross it soon thereafter. In opposition to the bandit tactics of Villa, an American expedition, led by Gen. Pershing (*q.v.*), set out to capture him but succeeded only in arousing resentment in the Mexican people. Villa escaped to Northern Mexico where he remained to live, a hero to some, a bandit to others, until his mysterious assassination in 1923.

Villafranca (*vēl-lä-fräng'kä*), a town of Northern Italy, 9 m. s.w. of Verona, on the Tartaro River. Formerly it was strongly fortified and played an important part in the military movements of Southern Europe. The Austrians under Gen. Radetzky defeated the Sardinians under King Charles Albert at Villafranca on July 25, 1848, and the Italians were defeated here by the Austrians on Jan. 24, 1886. The Treaty of Villafranca, concluded July 11, 1859, between Francis Joseph of Austria and Napoleon III, terminated the Italian war and transferred Lombardy to Victor Emmanuel of Sardinia. Population, *ca.* 5,000.

Villa-Lobos (*vĭl'lä-lō'bôs*), HEITOR, composer, born in Rio de Janeiro, Brazil, March 5, 1887; died there, Nov. 17, 1959. He had little formal musical education but started to study with his father when he was six years old. His earliest compositions appeared around 1910, and in 1922 he was awarded a government fellowship to study in Paris, France, where he remained until 1926. After his return to Brazil, he continued to compose, and he founded an orchestra there. Villa-Lobos, who became director of musical education in Rio de Janeiro in 1931, greatly influenced music teaching in his native country.

Villa-Lobos' most noted works are based on his interpretation of Brazilian folk music, but he wrote all kinds of music, often employing a polytonal technique. His first major orchestral composition was *"Dansa do Indios Mesticos"* (1917). His *"Chôros,"* in which he made use of Brazilian and Indian melodies and music sung and played by street musicians, are especially notable. His last work, "Songs of the Tropical Forest," was composed for the motion picture "Green Mansions" (1959). Villa-Lobos produced more than 1,200 compositions. His *"Alma do Brasil,"* a book of folk music, appeared in 1929.

Villanelle (*vĭl-à-nĕl'*), a poem, frequently pastoral or lyrical in content, composed of five three-line stanzas and a concluding quatrain. Only two rhymes are employed, arranged as follows: *aba aba aba aba aba bbaa.* The first and third lines of the first stanza are alternately repeated in the stanzas which follow, and they also appear as a couplet in the last two lines of the quatrain. The form had its origin in a popular type of round which was sung in Southern European countries as the accompaniment for a rustic dance. The first professional master of the form was the 16th-century poet Jean Passerat.

Villard (*vĭ-lärd'*), HENRY, capitalist, born in Speyer, Bavaria, Apr. 11, 1835; died at Dobbs Ferry, N.Y., Nov. 12, 1900. He dropped his original name, Ferdinand Heinrich Gustav Hilgard, when he came to the U.S. in 1853. In this country he worked as a reporter for German-American newspapers, and later for the New York *Herald,* the New York *Tribune,* and others. He became interested in railroad financing while representing German investors in Pacific coast railroad transactions. Eventually he created a pool of railroad investments, forming the Northern Pacific Railroad Co., of which he was elected president. He was active in railroad financing until 1893, and was for a time the nation's outstanding railroad financier. He was interested in the inventions of Thomas Alva Edison (*q.v.*) and founded the Edison General Electric Co. in 1899. He purchased the controlling interest in the New York *Evening Post* in 1881. He married (1866) HELEN FRANCES GARRISON (1844-1928), only daughter of the famous abolitionist William Lloyd Garrison (*q.v.*).

Their son OSWALD GARRISON VILLARD was born Mar. 13, 1872, in Wiesbaden, Germany. He received his M.A. and B.A. at Harvard Univ. After a year as a teaching assistant in history at Harvard he became a reporter on the Philadelphia *Press,* and went to work on his father's paper in 1897, serving eventually as editor, and later as president of the board until he sold the paper in 1918. He retained the ownership of the *Nation,* a weekly magazine which had been part of the

Evening Post, and under his editorship it became one of the leading liberal magazines in the U.S. When he sold the magazine in 1932 he continued as contributing editor and publisher until 1940 when he resigned because his uncompromising pacifism was at odds with the editorial stand of the magazine. Known and respected as a crusading, liberal journalist, he was also the author of a number of books on historical and journalistic topics. He died in New York City, Oct. 1, 1949.

Villari (*vēl'lä-rē*), PASQUALE, educator and historian, born at Naples, Italy, Oct. 3, 1827; died in 1917. He studied law at Naples, but was forced to leave the country for taking part in the revolutionary movement of 1848-49. Subsequently he studied and resided at Florence, and in 1859 became professor of history in the Univ. of Pisa. For several years he was general secretary of public instruction, was chosen deputy in 1867, and became senator in 1884. He was minister of public instruction in 1891-92, in which capacity he gathered material for a number of reports, and subsequently devoted his attention mainly to historical writings. Among his works are "The First Two Centuries of Florentine History" and biographies of Savonarola and Machiavelli.

Villars (*vē-lär'*), CLAUDE LOUIS HECTOR, military leader, born in Moulins, France, May 8, 1653; died in Turin, Italy, June 17, 1734. He was the son of the Marquis de Villars and, after studying at the Coll. of Juilly, entered the army as a volunteer. His first services in Holland were under Louis XIV. Later he served under Condé and Turenne in Germany, where he was made commander of a troop of horsemen in 1674. He was promoted to lieutenant general in 1693, and represented the French at the court of Vienna from 1686 until 1701. In 1702 he was sent to cooperate with the Elector of Bavaria in the War of the Spanish Succession and on Oct. 14 of that year defeated Prince Louis of Baden at Friedlingen. For his services he was promoted to marshal. In 1703 he defeated the Prince of Baden at Höchstädt and soon captured a number of towns in Germany. He was sent to supersede Vendôme in Flanders in 1709, and was seriously wounded at the Battle of Malplaquet against Eugene and Marlborough. His successes in 1712 at Denain and Landrecies hastened the Peace of Utrecht, in 1713, and his series of successes against Eugene brought about the Peace of Rastatt in 1714. When the war with Austria was renewed, in 1733, he was made marshal general of France and sent into Italy with a large army. He died while returning to France after a successful campaign. Villars is regarded as one of the greatest generals of the age of Louis XIV.

Villein (*vĭl'ĭn*), the name of a particular kind of feudal serf, who occupied a middle position between the freeman and the menial serf. Some writers call all the peasants of the Middle Ages, whether free or unfree, villeins. According to others, all free peasants were termed villeins to distinguish them from those bound to the soil. The term had a local significance in some sections, where the villein occupied a portion of land at the will of the landlord, but was required to perform menial labor. Usually the villeinage descended in regular succession from father to son, but later the villeins were permitted to occupy the lands only as a consideration for performing work in a satisfactory manner. After the serfs of this class acquired their freedom, they still continued their services as a condition of the tenure, but they came to be known as *half* or *full* villeins according to the size of the acreage held by the individual. The former had reference to about 15 and the latter to 30 acres, while a tract of 120 acres was known as a *hide*. See also *Serf*.

Villiers (*vĭl'ĕrz*). See *Buckingham*.

Villon (*vē-yôn'*), FRANÇOIS, poet, born near Paris, France, in 1431; died *ca.* 1463. Born into a poor family named De Montcorbier, he is supposed to have later adopted the name of his guardian, Guillaume Villon. A great lyric poet and an incorrigible vagabond, Villon reveals in his intensely personal verses glimpses of his private life, details of which fill the police records of his time. Offenses leading to his arrrest and finally to banishment from his native city included the murder of a priest (1455), burglary (1457), theft, and brawling. However, he is remembered for his great contributions to French literature, including the colorful panorama of his times in the verses of the *"Petit Testament"* (1456) and the *"Grand Testament"* (1461). Both are mock wills containing several individual rondeaux and ballades, one of the most famous of which is the *"Ballade des dames du temps jadis"* with its oft-quoted refrain, "But where are the snows of yesteryear?" Numerous English translations of his works have been made.

Villus (*vĭl'ŭs*), plural *villi,* a minute club-shaped projection from the mucous membrane of the intestine, and also from certain other organs or tissues of the body. An *intestinal villus* consists of a central axis of lacteals (see *Lymphatic System*), capillaries, cellular tissue, and unstriped muscle, covered by a thin membrane upon which there is a single layer of columnar epithelium (*q.v.*). Its function is absorption of fat and other products of digestion and secretion of mucus. *Arachnoid villi* (pacchionian bodies) are small projections of the arachnoid membrane (layer of tissue covering the brain) into the large veins of the brain beneath the skull through which the tissue fluids of the brain are drained into the blood system. *Synovial villi* are small threadlike processes of the synovial membranes (linings of joint spaces) through which the fluid content (lubrication) of the joint spaces is maintained.

Vilna (*vĭl′nạ*) or VILNYUS, the capital of Lithuania, situated on the Neris River, 480 m. S.W. of Moscow. Located at the intersection of a number of railway lines, it is a major cultural, commercial, and industrial city. Its products include agricultural tools, radios, motors, fertilizer, oils, cotton, glass, and leather goods. It has a university (founded in 1578 by Stephen Bathory), art and teachers colleges, a music conservatory, and many churches, including the Roman Catholic cathedral (1387) and the Gothic St. Anne and St. Bernard. At the foot of the ruins of a 14th-century castle is an inner city that was formerly walled. Founded in the 10th century, Vilna is rich in historical associations. In 1323 it became the capital of the grand duchy of Lithuania and, after the union (1569) of Poland and Lithuania, a center of Polish culture. After the partition of Poland in 1795, it became part of Russia. During World War I, it was held by the Germans, and between 1918 and 1920 changed hands repeatedly among the Poles, the Soviets, and the Lithuanians. It was in Polish hands from 1920 to 1939, when Russia seized it and returned it to Lithuania. The Germans occupied it (1941-44) and, during their occupation, killed almost all of the members of the Jewish community, a center of Jewish culture since the 16th century. In 1944 Vilna was recaptured by the Russians, who made it the capital of Lithuania, replacing Kaunas (Kovno). Population, *ca.* 250,000.

Vilyui (*vyĭ-lū′ĭ*), a river in the autonomous republic of Yakutsk, in the U.S.S.R. Rising in the central Siberian uplands, it flows *ca.* 1,500 m. east through farm lands to the Lena River, *ca.* 180 m. N.W. of Yakutsk. It abounds in fish; and platinum and gold are found along its shores. Vilyuisk, a fur-trading center, is on its banks. The Vilyuisk Range, rising to a height of 3,300 ft., separates it from the Olenek River Basin.

Vimeiro (*vē-mä′ē-rōō*), a village in Portugal, 32 m. N.W. of Lisbon. It was the scene of a battle (Aug. 21, 1808) of the Peninsular War, in which Arthur Wellesley (late the duke of Wellington) defeated the French under Junot. Population, *ca.* 800.

Vimy (*vĭm′ĭ*), town in the department of Pas-de-Calais, in northern France, *ca.* 95 m. N.E. of Rouen. A 475-ft. hill, known as Vimy Ridge, dominates the town and was an important scene of battle during World War I. Vimy Ridge was a vantage point for the Germans until its capture by Canadian troops in a fierce battle in April 1917. A memorial was erected in 1936 to the Canadian soldiers who lost their lives there. Population, *ca.* 2,500.

Viña del Mar (*bē′nyä THĕl mär′*), a city in Chile, in Valparaiso province, on the Pacific Ocean, 6 m. N.E. of Valparaiso. Situated on a protected bay and enjoying a mild climate, it is the resort center of Chile and has many beautiful parks, wide boulevards, luxury hotels, a casino, and a race track. Besides tourism, its industries include sugar and petroleum refining and textile milling. Population, 1952, 88,000.

Viñales (*bē-nyä′läs*), a town in the province of Pinar del Río, in western Cuba, *ca.* 100 m. S.W. of Havana. Its principal products are cigars and lumber. There are oil, coal, and copper deposits in the area, and nearby is Viñales Valley, a tourist site with unusual rock formations. Population, 1953, 15,950.

Vincennes (*vĭn-sĕnz′*), a town in the department of Seine, France, in the suburbs of Paris. It has a historic 14th-century castle, where several kings of France and Cardinal Mazarin died. The castle was used as a royal residence, and its dungeon was made a state prison in the 17th century. Condé, Mirabeau, Fouquet, Diderot, and other notables were imprisoned there at various times, and the duke of Enghien was shot in a castle moat in 1804. The nearby Bois (woods) de Vincennes has a large public park. There is a French colonial museum (1935) and a library dedicated to the history of World War I. The town's manufactures include electrical equipment, perfumes, toys, and candy. Population, 1954, 50,434.

Vincennes, a city in southwestern Indiana, the county seat of Knox County, on the Wabash River, *ca.* 100 m. S.W. of Indianapolis. It is a rail and shipping hub served by the Baltimore & Ohio, New York Central, Chicago and Eastern Illinois, and Pennsylvania R.R.'s. It is situated in an agricultural region which has coal, oil, and natural-gas deposits. Its manufactures include glass, paper products, structural steel, shoes, processed foods, and flour and grain products. It is the seat of Vincennes Univ. (1806). The oldest settlement in the state, it was established as a French fur-trading village by 1727 and fortified in 1732 by François Marie Bissot, Sieur de Vincennes, for whom the town was named. It was known as Ft. Sackville when the British occupied it (1763). Held by the Americans during the Revolution, the post was seized by the British in 1778 and recaptured the following year by the Americans under George Rogers Clark (the city dedicated a memorial to him in 1936). The capital (1800-13) of the Indiana Territory, it was incorporated as a city in 1856. Population, 1950, 18,831.

Vincent de Paul (*văn̲-sän̲′ dē pōl*), SAINT, priest, noted for founding French charitable organizations, born in Pouy, in Gascony, France, April 24, 1576; died in Paris, Sept. 27, 1660. He was educated by Franciscan monks and was ordained to the Roman Catholic priesthood in

Courtesy The Bettmann Archive, N.Y.

SAINT VINCENT DE PAUL

A contemporary painting

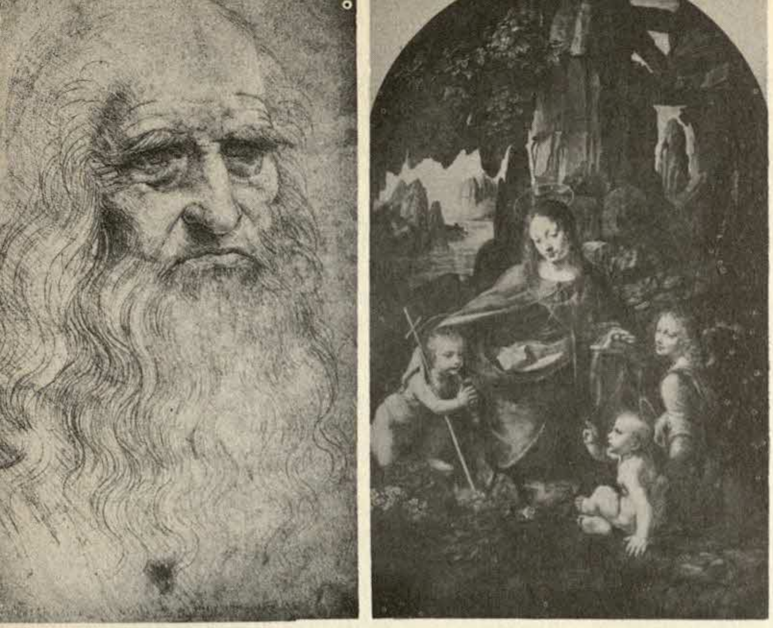
1600. He was captured by Barbary pirates while making a sea voyage and was sold into slavery at Tunis. Escaping, he returned to France (1607) and resumed his religious studies at Avignon and Rome. Later he became almoner to Queen Marguerite of Valois and took charge of the parish of Clichy, near Paris. In 1625 he initiated the Congregation of Priests of the Mission, also known as Congregation of Lazarist Missionaries, a religious institute of priests vowed to evangelize in rural districts. The first missions were at Joigny, Châlons, Mâcon, and Trévoux, but soon the movement developed and his educational work was centered at St.-Lazare in Paris. He went into the dungeons of Paris, Marseilles, and Bordeaux and did missionary and welfare work among convicts, establishing a hospital for galley slaves at Marseilles. He also founded (1634) the Sisters of Charity, an organization of women who cared for the sick and poor, and whose patron saint he became in 1885. With contributions from the nobility, including the king, he established foundling homes and charitable institutions where old or incurably sick persons, and the poverty-stricken, could live and at the same time work. He was buried at the Church of St.-Lazare in Paris. Beatified in 1729, he was canonized in 1737. The Society of St. Vincent de Paul, named after him, was founded in 1833. His feast day is celebrated on July 19.

Vincent (*vĭn'sẹnt*), GEORGE EDGAR, educator, born in Rockford, Ill., March 21, 1864; died in New York City, Feb. 1, 1941. The son of John Heyl Vincent (*q.v.*), he was graduated from Yale Univ. in 1885 and a year later received his Ph.D. at the Univ. of Chicago. He taught sociology at Chicago from 1894 to 1911, serving as dean of the faculty of arts, literature, and science during his last four years. He was associated with his father in the Chautauqua Movement and was president of the Chautauqua Institution (*q.v.*) from 1907 to 1915. In 1911 he became president of the Univ. of Minnesota, and from 1917 to 1929 he was president of the Rockefeller Foundation. In this post he traveled widely in Europe, surveying hospital facilities and needs. His sociological works include "An Introduction to the Study of Society" (1895, with A. W. Small) and "Social Mind and Education" (1897).

Vincent, JOHN HEYL, clergyman and author, born in Tuscaloosa, Ala., Feb. 23, 1832; died in Chicago, Ill., May 9, 1920. After studying in Lewisburg and Milton, Pa., he studied at the Wesleyan Inst., in Newark, N.J., and was given a pastorate in Illinois. Particularly interested in improving methods of teaching Sunday school, he founded (1864) "The Sunday School Teacher" and in 1868 became editor of Methodist Sunday school publications. With Lewis Miller, he organized (1874) a Sunday school teachers institute at Chautauqua, N.Y., out of which grew the Chautauqua Movement (see *Chautauqua Institution*). In 1888 he was made a bishop. Vincent lived in Buffalo, N.Y., until 1892; in Topeka, Kans., 1892-1900; and in Zurich, Switzerland, from 1900 until he retired in 1904. Among his many books are "The Chautauqua Movement" (1886) and "The Modern Sunday School" (1887).

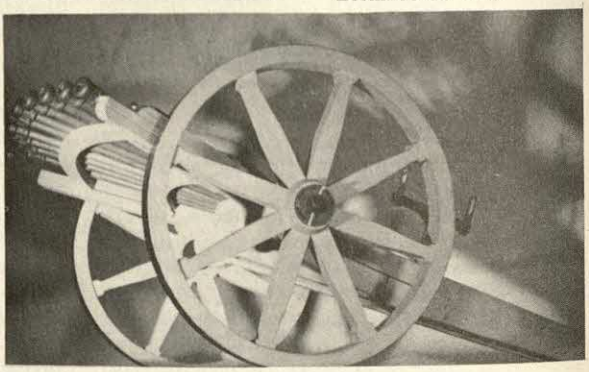
Vincent of Beauvais (*vĭn'sẹnt ŭv bô-vē'*) or VINCENTIUS BELLOVACENSIS, Dominican scholar and encyclopedist, born *ca.* 1190; died *ca.* 1264. Little is known of his life. He probably lived at Beauvais, in France, and is known to have held, at one time, the post of "reader" at the Royaumont monastery near Paris. He compiled and wrote a massive summary of the knowledge of the world in the Middle Ages. The work, *"Speculum Majus"* ("Great Mirror"), consisted of 32 books and 3,718 chapters on natural history, with references to authorities; of 17 books and 2,374 chapters summarizing what was then known of mathematics, music, astronomy, theology, mythology, etc., and constituting a manual for the guidance of political and military officials; and of 31 books and 3,793 chapters giving the history of the world. A fourth part of the book, *"Speculum Morale,"* although included in all printed editions, is not found in the original manuscripts extant and is believed to have been added by another writer early in the 14th century.

Vinci (*vēn'chē*), LEONARDO DA, painter, archi-



THE ARTIST

A self-portrait (*left*) and the "Madonna of the Rocks," by Leonardo da Vinci



THE INVENTOR

Model of a 10-barreled machine gun, whose barrels could be fired individually or simultaneously. Many of Leonardo da Vinci's mechanical designs forecast objects invented and built many years later (*courtesy IBM*)

tect, scientist, and engineer, born in Vinci, near Florence, Italy, April 15, 1452; died at the Château Cloux, near Amboise, France, May 2, 1519. From early boyhood he exhibited great interest in the arts as well as in science, and when the family moved to Florence, Leonardo became the pupil (1466-69) of the painter and sculptor, Andrea del Verrocchio (*q.v.*). By 1472 he was a member of the painters' guild of Florence; in 1478 he is mentioned as an independent master. "The Adoration of the Magi," which was ordered (1481) for the church of San Donato di Scopeto in Florence, and which is preserved in an unfinished state in the Uffizi, Florence, proved his mastery of the arts at an early age. Only a few authentic paintings by Leonardo have come down to us, although many galleries claim to have an original work of the master. Of the few, each is a great treasure in itself. In the Milan period (1482-99), during which Leonardo worked at the court of Lodovico Sforza, his style turned to High Renaissance and he produced "Madonna of the Rocks" and "The Last Supper" (1499). The latter, preserved in the refectory of the monastery of Santa Maria delle Grazie, although badly damaged by the influences of weather, shows his immense power of characterization. The various types of the Apostles and their respective relations with Christ are expressively captured in this painting, of which numerous studies and sketches are extant, many of them with Leonardo's comments in the mirror writing he often employed. During his stay in Florence (from 1499 on), he created the painting which might be termed the best known all over the world, the "Mona Lisa," or "La Gioconda," the portrait of the beautiful wife of Francesco del Giocondo. The Louvre in Paris houses not only this painting but his "St. Anne with the Virgin and Christ Child" as well.

One of the chief characteristics of Leonardo's paintings is the so-called *sfumato,* the gradual transition from light to shadow, which helped greatly to intensify the three-dimensional appearance of the depicted objects. From his time on, *sfumato* was employed generally by Italian painters, especially by Antonio Allegri Correggio (*q.v.*); and, later, Northern artists took it up as well.

Leonardo also devoted time to the other arts. While in Milan, he engaged in engineering and military tasks for the reigning duke, Lodovico Sforza; he was employed in the construction of the cathedral of this town, and he worked on a colossal bronze monument for Francesco Sforza which he did not, unfortunately, complete. In 1502 Leonardo gave his services to Cesare Borgia as military engineer, working on various projects in central Italy. With Michelangelo, he was commissioned to design and execute frescoes for the Palazzo Vecchio in Florence. He maintained large studios and had a great number of pupils, both in Florence and Milan. In 1516 he joined the court of King Francis I of France and remained there until his death.

Ranking with Michelangelo, Leonardo was one of the greatest geniuses of the Renaissance. He was also interested in music, physics, meteorology, and anatomy and invented a number of useful devices which have inspired several modern inventions. The name of Leonardo is also connected with early mechanical flight. Among his many writings, the most widely known are *"Trattato della Pittura"* ("Treatise on Painting"), first published in 1651, and *"Codece Atlantico,"* both from his "Notebooks." See also *Mona Lisa.*

Vine (*vīn*). See *Grape.*

Vinegar (*vĭn′ẹ-gạr*), an acidic liquid used as a condiment and food preservative. The acidity of vinegar is due to acetic acid: ordinary table vinegar contains 4 to 6 per cent of acetic acid. Vinegar is made by fermenting a liquid containing sugar to form alcohol, then converting the alcohol to acetic acid by acetous fermentation. Vinegar can be made by merely allowing fruit juices to ferment in casks under the proper conditions of warmth and air supply. Modern vinegar is commercially produced, however, by passing an alcoholic solution slowly downward through a mass of wood shavings, or similar material, contained in a tall tank. These shavings are impregnated with the organisms which convert the alcohol to vinegar. At the same time, a current of air is passed upward through the shavings.

Several types of vinegar are known, including ordinary vinegar (apple vinegar, cider vinegar), prepared from apple juice; wine vinegar, from grape juice; malt vinegar, from barley malt or malted grain; and distilled vinegar, prepared by the acetous fermentation of dilute distilled alcohol. The flavors differ, and malt and wine vinegars are preferred by many for their distinctive flavors. The principal regions in the U.S. for vinegar production include New York, Pennsylvania, Ohio, Missouri, Michigan, and California.

Vinland (*vĭn′lạnd*) or WINELAND, the region of the North American coast discovered *ca.* A.D. 1001 by Leif Ericsson (*q.v.*). He named it Vinland because of the abundance of grapes which he found there. Later expeditions, notably that of Thorfinn Karlsefni, attempted to rediscover the region. In modern times there has been much speculation, none of it conclusive, on the location of Leif's Vinland. Various sites from Newfoundland to Virginia have been nominated, but the most generally accepted locality, on the evidence of directions, distances, topography, flora, and fauna, is southern New England. The Old Stone Mill, a tower at Newport, R.I., has been claimed as a relic of the Norse settlement; according to another theory, it was built in colonial times (for an illustration see *Rhode Island*).

Photo by Fabian Bachrach

FREDERICK M. VINSON

Vinson (*vĭn′sŭn*), FREDERICK MOORE, jurist, born in Louisa, Ky., Jan. 22, 1890; died in Washington, D.C., Sept. 8, 1953. Educated at the Kentucky Normal Coll., he studied law at Center Coll. and set up a practice in Louisa. After holding several state offices, he was elected to the U.S. Congress, where he served several terms (1923-29, 1931-37), resigning to become an associate justice (1937-43) of the U.S. Court of Appeals for the District of Columbia. In May 1943 he was appointed director of the Office of Economic Stabilization. In April 1945 he became director of the Office of War Mobilization and Reconversion. Vinson was (1945-46) Secretary of the Treasury under President Truman and served as Chief Justice of the U.S. Supreme Court from 1946 until his death. Always able to reconcile controversial points of view, he achieved harmony among the members of the high court, who, at the time of his appointment, were split by dissension.

Vio (*vē′ō*), GIACOMO DE, CARDINAL CAJETAN, Roman Catholic prelate and scholar, born in Gaeta, Italy, Feb. 20, 1469; died in Rome, Aug. 9, 1534. He joined the Dominicans (*ca.* 1486), became general of the order (1508), and was made a cardinal (1517). In 1518 he was sent as papal delegate to Augsburg, Germany, where he tried in vain to reconcile the differences between

Martin Luther and the Church. He also bitterly opposed the divorce of Henry VIII of England from Catherine of Aragon. Cardinal Cajetan's commentaries on the *"Summa"* of Thomas Aquinas were incorporated by Pope Leo XIII in the official edition of that work.

Viol (*vī′ŭl*), a musical instrument, in Italian, *viola da gamba,* meaning "leg viol." The instrument developed, like the violin (*q.v.*), around A.D. 1500 from several kinds of medieval fiddles. A complete family of viols, varying in size and pitch from small treble viols to the large bass viol, was soon in use; in the narrowest sense, only the bass viol should be referred to as a *viola da gamba.*

There are many differences between the violin and the viol families. Most important of these are: The viols had, as a rule, six strings, less thick than those of the violins; the stopping places on the viol fingerboard were given frets coiled around the neck, not so much for marking them, but for adding a sharp click to the sound; the bow was held with a palm-up hand and pushed forward, whereas the violin bow was pulled back; and all members of the viol family were held on or between the player's knees in performance. Except in Italy, the viols, with their milder, delicate tone, were considered nobler than the violins. After the violins had been generally accepted, about the 18th century, the viols were abandoned; they have recently been revived, however, for the performance of older music.

Viola (*vi-ō′lạ*). See *Violin.*

Violet (*vī′ō-lẹt*), a genus (*Viola*) of about 300 species of perennial, flowering plants, in the violet family. Found all over the world, most violets are very low plants with a cluster of leaves arising from the base. Each leaf has two leaflike flaps—stipules—at the bottom of the leaf stalk. A few violets are small shrubs.

The flower consists of five green sepals and five colored petals of three different shapes. A lower petal, or lip, is largest and has a backward-projecting spur which contains nectar. The other four petals are in pairs, two at the side and two at the top. Most violets come in some shade of purple or blue, but there are also wild white and yellow types. Besides the colored flowers, violets often produce later green flowers which produce plenty of seed without cross-pollination.

Three species of violet are extensively cultivated, the fragrant, sweet or florists' violet—*Viola odorata;* bedding violet—*Viola cornuta;* and the pansy—*Viola tricolor.* Some plants called violets belong in entirely different families, *e.g.,* the dog-toothed violet is in the lily family, and the African violet is in the gesneria family.

Violin (*vi-ō-lĭn′*), the most important bowed musical instrument. Colloquially, the violin is often called a fiddle, derived from the Anglo-Saxon *fithele;* the term fiddle was used for early predecessors of the violin.

The body of a violin consists of two boards, the front or soundboard, made of pine, and the rear or bottom, made of maple. Each of these is slightly vaulted and outlined to form three bouts (or curved sections), two curving out and the middle one curving in to form a "waist." The two boards are connected by a low sidewall, or rib, which follows their outlines closely. The handle, or neck, of a violin is a little shorter than its body, ends in a carved scroll (curving to the underside), and is covered with an ebony fingerboard. Four strings (of catgut or similar material) descend along the fingerboard and the soundboard and are tied to a tailpiece. The strings are lifted by a bridge near the middle bout and are tightened by lateral pegs below the scroll. The player squeezes the lower end of the violin under his chin and sets one or more strings into vibration with the resined horsehair of a bow held in his right hand, while, with his left hand, he "stops" the strings at the proper places along the fingerboard to change their vibrating lengths and hence their pitches. The strings communicate their vibrations to the bridge and via the bridge to the soundboard and the air inside the body. This communication is facilitated by an *f* hole in the soundboard at either side of the bridge.

The violin was developed out of several medieval fiddles around 1500 in northern Italy. A generation later, several kinds of violins were already in use, forming a complete family. These were the violin proper, today with the strings tuned in *g d′ a′ e″*, the viola, now tuned in *c g d′ a′*, and a basso, which has since been given up. In the 16th century a double bass, today tuned in *E*1 *A*1 *D,* appeared, and in the later 17th century, a violoncello (or simply a 'cello), now tuned in *C G d a,* was put in use. This family was long known as *viola da braccio* ("arm viols"), in contradistinction to the parallel family of the *viola da gamba* ("leg viols"). See also *Viol.*

Violin building was at first confined to Brescia and Cremona in northeastern Italy, but later spread to other localities and countries. Probably the best instruments were made in Cremona between 1720 and 1750, by Antonio Stradivari and his followers. By this time the violin had been used in all forms of music in Italy and Germany, although it was restricted to dance music in England until the end of the 17th century and was not widely used in France until the 18th century. From 1600 onward both Italy and Germany witnessed a rising standard of virtuosity in violin-playing and in composing for the instrument. It has been the uncontested leader in chamber and orchestral music, as well as a solo instrument, since the 18th century.

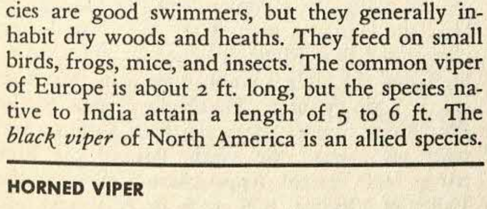
Among eminent violinists have been Louis Spohr (1784-1859), Ole Bull (*q.v.*), Luigi Boccherini (1740-1806), Nicolò Paganini (*q.v.*), Fritz Kreisler (*q.v.*), Jascha Heifetz (*q.v.*), Yehudi Menuhin (*q.v.*), and Nathan Milstein. Among the most popular concertos for violin and orchestra are that in D by Ludwig van Beethoven, that in E minor by Felix Mendelssohn, and those in D Major by Peter Tchaikovsky and Johannes Brahms. More modern works in this form include Béla Bartók's "Concerto for Violin and Orchestra."

Viollet-le-Duc (*vyô-lĕ′lē-dük′*), EUGÈNE EMMANUEL, architect and archaeologist, born in Paris, France, Jan. 27, 1814; died in Lausanne, Switzerland, Sept. 17, 1879. He is famous for his restorations of medieval French buildings and for his advocacy of Gothic as a style for modern French architects. He directed the restoration of Notre Dame Cathedral and the Sainte Chapelle in Paris and the cathedrals at Amiens and Laon. His writings include "A Dictionary of French Architecture from the 11th to the 16th Century" (ten vols., 1854-69) and "A Dictionary of French Furniture" (1855).

Violoncello (*vē-ō-lŏn-chĕl′ō*). See *Violin.*

Viper (*vī′pẽr*), a venomous serpent native to the Old World, including two or three species which differ slightly in color. It looks somewhat like the rattlesnake of America, but there are no rattles on the tail, and no teeth in the upper jaw aside from the two hollow poison fangs. The best-known species include the *common viper,* or *adder,* of Europe; the *horned viper,* or *asp,* of Africa; and the *Russell,* a small viper of India. In Western Europe the common viper is the only poisonous snake. It has a brownish yellow color, marked with black triangular spots, and its bite is not usually fatal, but it is quite painful and frequently produces fever and sickness. Vipers are viviparous animals, their eggs remaining within the body until fully incubated. Most species are good swimmers, but they generally inhabit dry woods and heaths. They feed on small birds, frogs, mice, and insects. The common viper of Europe is about 2 ft. long, but the species native to India attain a length of 5 to 6 ft. The *black viper* of North America is an allied species.

HORNED VIPER



Virchow (*vẽr′chou*), RUDOLF, pathologist and author, born in Schivelbein, Germany, Oct. 13, 1821; died Sept. 5, 1902. He was graduated from the Univ. of Berlin as a medical student in 1843. He was made lecturer on anatomy at the Univ. of Berlin, but, entering the political arena as a leader of the liberal party, he was deprived of his lectureship by the government in 1849. In the same year he was called to the chair of pathological anatomy in the Univ. of Würzburg, where he remained until 1856, when he was recalled to his former position in the Univ. of Berlin and made director of the Pathological Inst. He was elected to the Reichstag in 1880 and served on a number of important commissions. He was noted as a political opponent of Bismarck. In 1888 he treated Frederick III, who was afflicted with a cancerous disease, and thus became known to the world as an ultimate authority on pathology.

He traveled extensively and was the author of numerous distinguished works on anthropology.

Vireo (*vĭr′ē-ō*), or GREENLET, a family of insect-catching birds. They are restricted to the American Continent and range from Canada to Paraguay. About 60 species have been enumerated, including many birds of rare plumage and beautiful song. The representative species are about 6 in. long, with a wingspread of 10 in. The predominating color is dull green and yellowish, the bill is conical, and the nostrils are overhung by membrane. They build their cup-shaped nest of tough fiber of the inner bark of plants, instead of the more brittle grasses, and suspend it from the twigs of bushes and trees. The nest is lined with soft materials, such as wool and soft grasses, and the parts are carefully glued together with saliva. Most species are migratory, visiting the higher latitudes in May and returning in the fall to the tropical regions. The species common to Canada and the U.S. include the *warbling vireo,* the *red-eyed vireo,* the *yellow-throated vireo,* the *blue-headed vireo,* and the *white-eyed vireo.*

Virgil (*vẽr′jĭl*), PUBLIUS VIRGILIUS MARO. See *Vergil.*

Virginal (*vẽr′jĭn-al*), a legless keyboard musical instrument of the 16th and 17th centuries, the predecessor of the harpsicord. This box-shaped instrument was usually placed on a table or stand. The strings were of metal, and the compass of the instrument was three to three and one-half octaves.

Virginia (*vẽr-jĭn′ya*), a state in the South Atlantic section of the U.S., first of the original 13 colonies to be settled, one of the 13 original states of the Union, and the tenth state to ratify the Federal Constitution. The state was of major importance in the early history of the U.S. George Washington and seven other U.S. Presidents were Virginia men. Virginia now has a well-balanced economy based on manu-

facturing, trade, and agriculture. It ranks first among the states in the production of synthetic fibers, second in the manufacture of tobacco products, and third in shipbuilding. The ports of Hampton Roads—Newport News, Hampton, Norfolk, and Portsmouth—are among the world's largest coal-shipping centers.

Virginia is bounded on the N. by Maryland, the District of Columbia, and West Virginia; on the W. by West Virginia and Kentucky; on the S. by Tennessee and North Carolina; and on the E. by Maryland, Chesapeake Bay, and the Atlantic Ocean. It ranks 36th among the states in size and 15th in population, according to the 1958 estimates of civilian population (Alaska, Hawaii, and the District of Columbia included in both rankings). The state was named in honor of Queen Elizabeth I of England, the "Virgin Queen." Virginia's nickname is the "Old Dominion."

GEOGRAPHY

Virginia is divided into three geographic regions which cross the state roughly from north to south. The wide coastal, or Tidewater, section is part of the Atlantic coastal plain. The region is low, sandy, and in places given over to marshes, the best-known being the Great Dismal Swamp of southern Virginia and northern North Carolina. The coast line is so deeply cut by bays and river mouths as to form actually a series of peninsulas. This is a busy industrial and commercial region, containing the shipbuilding centers and the ports of Norfolk and the group of harbors known as Hampton Roads. The largest bay, Chesapeake Bay, separates the Delmarva Peninsula from the mainland. The southernmost tip of this peninsula belongs to Virginia and is called the "eastern shore." Elevations in the Tidewater region are generally below 300 ft.

Location	Between 75°15′ and 83°41′ W. long. and 36°32′ and 39°27 N. lat.
Area	40,815 sq. m.
Land	39,893 sq. m.
Inland water	922 sq. m.
Greatest extent:	
North to south	200 m.
East to west	425 m.
Population (1950)	3,318,680
Capital city	Richmond
Highest point	Mt. Rogers (5,720 ft.)
Lowest point	Sea level (Atlantic Ocean)
Entered the Union (10th state)	1788
Song	"Carry Me Back to Ol' Virginny," words by James Bland, music by E. P. Christy
Flower	Dogwood
Bird	Cardinal
Motto	*Sic Semper Tyrannis* (Latin, meaning "Thus Ever to Tyrants")
Flag	See color plate in Vol. XI

West of the Tidewater area is the Piedmont Plateau, part of a larger region extending from Alabama to Pennsylvania. This area is about four times wider at the southern end of Virginia than in the north. The plateau slopes upward from the Tidewater westward to the mountainous part of the state, where it is about 1,000 ft. high. A region of low rolling hills, it is one of Virginia's best farming areas, especially for the raising of tobacco.

The western part of Virginia subdivides into three narrow belts of mountain and valley country. Flanking the Piedmont are the Blue Ridge Mts., the highest region of the state. The lowest part of the Blue Ridge province is over 1,400 ft. high, and the highest point in the state, Mt. Rogers, is 5,719 ft. high. The highest areas of the Blue Ridge country are in northern Virginia and taper off toward the south. Beyond the Blue Ridge Mts. lies the Appalachian Valley, or the Valley of Virginia. It is made up of several separate valleys, the best known being the Shenandoah Valley. The soft limestone subsoil of the Appalachian Valley has been dissolved in places by underground streams, which have caused the formation of a number of interesting caverns. The largest and best known are those of Luray. Elevations in the valley run from 3,000 ft. to 4,000 ft. This pleasant part of Virginia is important for livestock and general farming. It attracts many visitors. The westernmost section of the state is part of the Appalachian plateau and contains the Allegheny and Cumberland Mts., a series of low, rounded, thickly forested peaks. Forestry and livestock raising are important activities here.

Four of Virginia's principal rivers empty into Chesapeake Bay: the Potomac, which rises in West Virginia; the James, rising in central Virginia and flowing east; the Rappahannock, which rises in northeastern Virginia; and the York, formed by the junction of the Pamunkey and Mattaponi rivers, and flowing southeast. The Potomac forms the southern boundary of Maryland. The Shenandoah River rises in the northeastern part of the state and empties into the Potomac, and the New River drains the southern third of the Appalachian Valley, flowing west into the Ohio.

Virginia is rich in places of historic interest. Among the many homes which have been preserved, some of them as national monuments or memorials, are George Washington's at Mt. Vernon; Thomas Jefferson's Monticello, near Charlottesville; the Custis-Lee Mansion near Arlington, home of Robert E. Lee and Martha Custis Washington's family; Washington's birthplace, near Rollins Fork; and Booker T. Washington's birthplace, near Roanoke. Also noteworthy are Jamestown, site of the first permanent English settlement in North America; Yorktown, where Washington received Gen. Cornwallis' surrender, ending the Revolutionary War; the state capitol building in Richmond, once the capitol of the Confederacy; the Confederate White House, also at Richmond; and a replica of the McLean house, the farmhouse near Appomattox where Gen. Lee surrendered to Gen. Ulysses S. Grant, bringing the long and costly Civil War to an end. A whole colonial city has been restored at Williamsburg.

Much of the Civil War was fought in the area between Washington and Richmond, the capitals, respectively, of the North and the South. The scenes of the two battles of Bull Run (Manassas), the battle of Fredericksburg, and the defense of Richmond are preserved as National Battlefield Parks, and many others have been made parks or are explained by markers.

ANNUAL STATE EVENTS

Lee's Birthday	Jan. 19; statewide; special ceremonies at Stratford (Lee's birthplace), in Westmoreland County
Founder's Day	April 13; Charlottesville; commemorates founding of the Univ. of Virginia by Thomas Jefferson; celebrated on his birthday
Apple Blossom Festival	Late April or early May; Winchester; Shenandoah Valley is in bloom at this season
Jamestown Day	May 13; Jamestown; date of the founding of the first permanent English settlement in the U.S.
State Fair	Late September; Richmond

The Skyline Drive, which follows the crests of the Blue Ridge Mts. in the Shenandoah National Park, affords a series of breath-taking views of the lovely Shenandoah Valley. Other natural wonders of the state include its many springs and caverns, a natural bridge near Lexington and one at Beatty Creek, and a natural tunnel near Clinchport.

Climate: Summers in Virginia tend to be long, the winters, short and mild. Snow rarely falls except in the mountainous western counties. Humidity is high in the Tidewater region in summer, but it is pleasantly cool in the highlands of the west. The rainfall is everywhere sufficient for farming and tends to be heaviest during July and August.

	Norfolk	*Richmond*
Normal temperature		
January	41.1° F.	39.6° F.
July	78.7° F.	77.9° F.
Annual mean	60.7° F.	58.6° F.
Latest frost	March 18	April 2
Earliest frost	Nov. 27	Nov. 8
Precipitation		
January	3.17 in.	3.63 in.
July	6.05 in.	5.38 in.
Annual	43.26 in.	42.17 in.
Average growing season	242 days	218 days

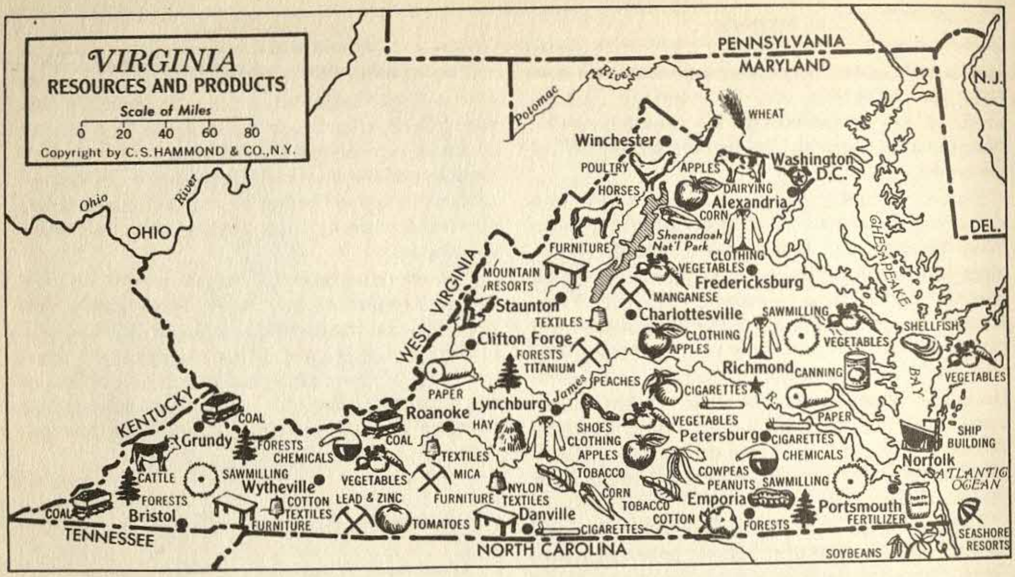
NATURAL RESOURCES

Virginia is rich in natural resources. The soil of its farms and plantations has been yielding fine crops for more than three centuries. The eastern part of the state produces truck crops, peanuts, and grains. The Piedmont area is largely devoted to tobacco, while the western counties raise fruits, hay, grain, livestock, and poultry.

Bituminous coal, Virginia's chief mineral resource, occurs in large beds in the western part of the state. The size of the coal reserve was estimated at 10,713,000,000 tons in 1956. The leading metal mined in Virginia is zinc. Other minerals include limestone, clay, building stone, cement, sand, gravel, and lesser deposits of barite, marl, feldspar, mica, gypsum, manganese, and talc.

A large part of Virginia is wooded, mostly with second-growth forest except in the western counties. Forest land in 1953 was estimated at 15,832,000 acres. The 1952 timber cut was 1,560,000,000 bd. ft., of which 865,000,000 bd. ft. were softwood and 695,000,000 were hardwood. Loblolly pine is the commonest tree in the coastal sections, together with oak and gumwood. In the Piedmont grow oak, hickory, and some pine. Much pine has been planted here as a "crop" on abandoned farms. In the mountain and valley counties, oak, chestnut, poplar, and hickory are the most important, but some shortleaf, pitch, and white pines grow here too.

The waters of Chesapeake Bay and Virginia's many tidal rivers abound with fish and shellfish. Virginia oysters, crabs, and clams are famous, and



large catches are also made of croaker, porgy, mackerel, menhaden, bass, and shad.

The state's many historic sights and points of natural beauty form the basis of an important and growing tourist industry.

Conservation activities in Virginia include the regulation of fishing and shellfishing practices, the establishment of game preserves, and the protection of forests through fire prevention and reforestation.

VIRGINIA'S ECONOMY

Once primarily an agricultural state, Virginia now employs more people and produces a greater value of product through manufacturing. In 1950, out of a civilian labor force of 1,196,676 persons, 28.5 per cent were employed in some phase of manufacturing; only 14.6 per cent were engaged in agriculture. Virginia's leading industry is the making of chemical products, especially synthetic fibers. Value added by manufacture of chemicals in 1954 was $435,655,000, including $235,309,000 by synthetic fibers. Next in importance is tobacco processing, especially the making of cigarettes, centered in Richmond, which had a value added by manufacture of $202,069,000 in 1954. Other important manufactures and their value added for 1954 were food processing, $167,103,000; textiles, $163,399,000; transportation equipment, $129,027,000; and pulp and paper products, $102,124,000. Additional manufactures include furniture; lumber products; stone, clay, and glass products; and fabricated metal products. In 1956 the total value added by all forms of manufacture was $1,897,000,000.

In 1954 Virginia had a total farm acreage of 14,686,000, with 107.7 acres the average per farm. Livestock produces the largest part of Virginia's agricultural profit, and in 1956 receipts from the sale of cattle and calves totaled $48,851,000, while receipts from the sale of hogs and lard totaled $17,338,000. In 1956 Virginia ranked fifth among the states in tobacco production, third in production of peanuts, and fourth in production of apples. In 1957 the cash income from the sale of crops and livestock and from government payments totaled $448,084,000.

Virginia ranked 20th among the states in mineral production in 1956, producing minerals valued at $208,806,000, which represented 1.20 per cent of the total U.S. production. Leading minerals in order of value were coal, stone, cement, and sand and gravel. Virginia fisheries had a 1956 catch valued at $19,271,000.

TRANSPORTATION AND COMMUNICATION

The navigable waterways of Virginia include Chesapeake Bay and the Potomac, James, Rappahannock, and York rivers. Norfolk, the state's chief port, handled 36,000,000 tons of commerce in 1955; Newport News, busiest harbor of the group of ports called Hampton Roads, handled 20,615,577 tons. Other important Virginia ports include Richmond and Alexandria.

The first railroads in Virginia were the Chesterfield R.R. (1831), now abandoned, and the Petersburg R.R. (1832), now a part of the Atlantic Coast Line R.R. Among the other principal railroads are the Norfolk and Western Ry., the Seaboard Air Line R.R., the Chesapeake and Ohio Ry., the Baltimore & Ohio R.R., the Southern Ry., and the Pennsylvania R.R. Railroad mileage comprised 4,130 m. in 1956. In the following year, road mileage totaled 49,502 m., of which 11,729 m. were surfaced. All the major cities and towns have airfields. The state had 108 radio stations and 15 television stations in 1957. The earliest newspaper in Virginia was the *Vir-*

ginia Gazette, established in Williamsburg in 1736. Among today's leading newspapers are the Richmond *Times-Dispatch* and the *News-Leader,* the Roanoke *Times* and *World-News,* and the Newport News *Press* and *Times-Herald.*

POPULATION

Virginia has 98 counties. The state's 1950 urban population comprised 47 per cent of the total population; the rural population, 53 per cent. Between 1940 and 1950, the urban population rose 41.4 per cent over that of 1940; the rural population, 14.4 per cent. Over a fourth of the population of the entire state lived in the four urbanized areas of Richmond, Norfolk-Portsmouth, Roanoke, and Washington, D.C. Virginia's population was estimated at 3,935,000 on July 1, 1958. In 1950 white persons numbered 2,581,555; of these, 2,546,485 were native born and 35,070 were foreign born. Nonwhite persons totaled 737,125; out of this group 734,211 were Negroes, with the remainder including Indians, Chinese, Japanese, and others. Population density in 1950 averaged 83.2 per sq. m.

The major religious faith in 1950 was the Protestant, with a small Roman Catholic group and a very small Jewish group. The predominant Protestant bodies were the Southern Baptist Convention, The Methodist Church, the Presbyterian Church in the U.S., and the Protestant Episcopal Church.

Chief Cities: Richmond, the state capital and largest city, is at the head of navigation on the James River. It is also the cultural, business, and manufacturing center of the state.

Norfolk, at the mouth of the Elizabeth River in southeast Virginia, the state's second-largest city, is one of the Hampton Roads ports, a shipbuilding center, and a naval base.

Roanoke, in southwestern Virginia, is third in size and an industrial center.

Alexandria, on the Potomac River in northern Virginia, is a suburb of Washington as well as a port, railroad terminal, and manufacturing center.

Portsmouth, on the Elizabeth River across from Norfolk, is part of the Hampton Roads port group, a railroad and manufacturing center, and a naval base.

Famous Men and Women: Byrd, Richard E. (1888-1957), naval officer and polar explorer.

Clay, Henry (1777-1852), statesman, who arranged the Compromise of 1850 in an effort to prevent the Civil War, and who helped negotiate the treaty of Ghent, which ended the War of 1812.

Dare, Virginia (1587- ?), first white child born in the 13 colonies.

Harrison, William Henry (1773-1841), ninth President of the U.S. (1841).

Henry, Patrick (1736-99), statesman, famous for his speech declaring "Give me liberty or give me death!"

Jackson, Thomas Jonathan (1824-63), Confederate general, better known as "Stonewall" Jackson because of his stand at Bull Run; commanded at battles of Shenandoah Valley and Chancellorsville.

Jefferson, Thomas (1743-1826), third President of the U.S. (1801-09), author of the Declaration of Independence.

Lee, Robert E. (1807-70), military leader, commander of the Army of Northern Virginia for the South in the Civil War.

McCormick, Cyrus Hall (1809-84), inventor of the mechanical reaper.

Madison, James (1751-1836), fourth President of the U.S. (1809-17).

Marshall, John (1755-1835), Chief Justice of the Supreme Court (1801-35).

Mason, George (1725-92), statesman, who drew up most of Virginia's constitution (1776).

Monroe, James (1758-1831), fifth President of the U.S. (1817-25).

Pocahontas (1595?-1617), daughter of Chief Powhatan; purported to have saved the life of John Smith during the early days of the Jamestown colony.

Poe, Edgar Allan (1809-49), Boston-born poet and writer ("The Raven," "Annabel Lee"), who was brought up in Virginia.

Taylor, Zachary (1784-1850), 12th President of the U.S. (1849-50).

Tyler, John (1790-1862), tenth President of the U.S. (1841-45).

Washington, Booker T. (1856-1915), Negro educator. Born a slave, he founded Tuskegee Inst.

Washington, George (1732-99), statesman and general, who commanded the Revolutionary Army and became the first President of the U.S. (1789-97).

EDUCATION

Education is free and compulsory for children between the ages of seven and 16. The state's public-school system was established in 1870. Public-school enrollment totaled 775,200 in 1957. At the time of the 1954 U.S. Supreme Court decision regarding desegregation, separate schools were maintained for white and Negro students. Leading state-supported institutions of higher learning include the Univ. of Virginia, Charlottesville; Virginia Military Inst., Lexington; Virginia Polytechnic Inst., Blacksburg; the Coll. of William and Mary, Williamsburg; and Virginia State Coll. (for Negroes), Petersburg. Among the outstanding privately supported institutions of higher learning are Washington and Lee Univ., Lexington; the Univ. of Richmond, Richmond;

and Hampton Inst. (for Negroes), Hampton.

Cultural institutions include the restored colonial city of Williamsburg; the Virginia Historical Society, Richmond, which has a huge library of books and manuscripts relating to Virginia history; the Virginia Museum of Fine Arts, Richmond, featuring paintings by Italian, English, French, and Dutch artists; and the War Memorial Museum, Newport News, with weapons of both World Wars and the Korean conflict. The Mariners' Museum, near Hampton Roads, contains more than 700 models of ships from all periods of history, as well as figureheads and working models of marine engines.

GOVERNMENT

Virginia is governed under provisions of a constitution dating from 1902 and later amended and revised. The constitution gives executive authority to a governor, lieutenant governor, and attorney general, each elected for a term of four years. The governor appoints some other executive officials. The legislature, called the general assembly, is the oldest continuously operating legislative body in the U.S., having begun as the House of Burgesses in 1619. It consists of a senate of 40 members, elected to staggered four-year terms; and a house of delegates of 100 members, all elected every two years. The legislature convenes regularly in Richmond, the capital city, on the second Wednesday of January in the even-numbered years, for a session limited to 60 calendar days. The supreme court consists of seven judges elected by the legislature to serve 12-year terms. The judicial system also includes circuit courts, city courts, and justice-of-the-peace courts. The state is represented in the U.S. Congress by two Senators and ten Representatives.

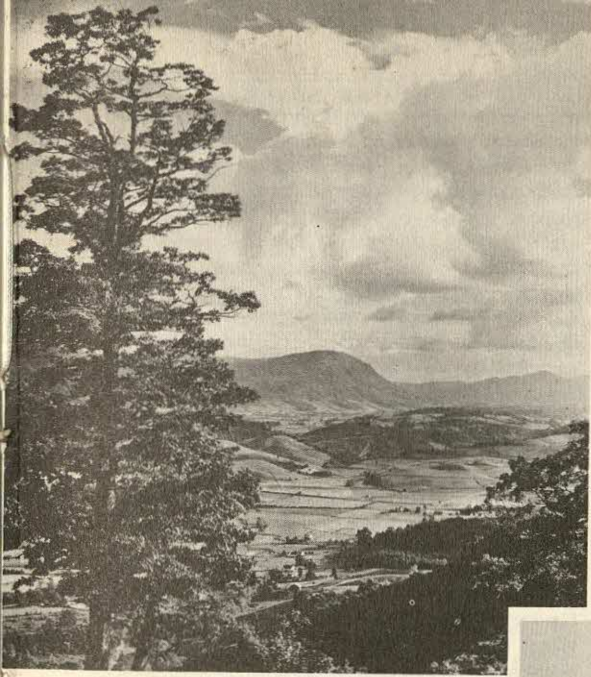
HISTORY

In 1584 Sir Walter Raleigh received from Queen Elizabeth I of England a charter granting him a large tract of land in North America, including what is now Virginia. Two unsuccessful colonies were started in 1585 and 1587 on Roanoke Island. The first group returned to England after a year; and the second—117 men, women, and children—had mysteriously disappeared when supply ships returned in 1591.

In 1606 James I granted a new charter to a group of adventurers called the London Co.; the grant included much additional land to the north and west. The London Co.'s men landed at the mouth of the James River in 1607 and established the settlement of Jamestown, which proved to be the first permanent English colony in North America. Hard times overtook the settlers at once, for they were ill-informed about conditions in the New World and unused to hard work. Fortunately, an experienced soldier among them, Capt. John Smith, arose as leader and persuaded the men to plant crops and build defenses. Although half the colonists died the first winter during the "starving time," the remainder stayed on and were soon reinforced. In 1612 John Rolfe, who later married the famous Indian princess, Pocahontas, started the planting of tobacco, which soon became the colony's main crop. At first the colony relied for labor on indentured servants from England, but in 1619 a Dutch ship sailed

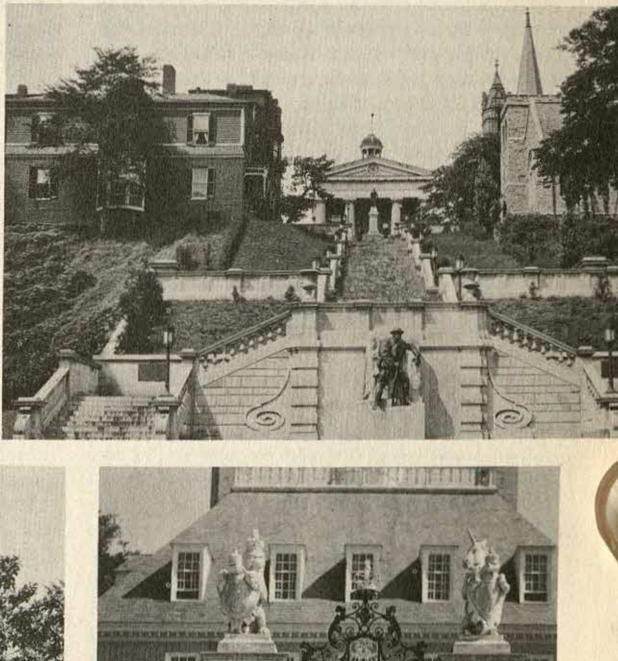
MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	*Size and Location*	*Points of Interest*
Shenandoah National Park (established 1935)	211,325 acres stretching from near Waynesboro to Front Royal (Skyline Drive)	160-m. road follows crest of Blue Ridge Mts.; views of Shenandoah Valley; preserved mills and cabins; rhododendron and laurel bloom in season
Appomattox Court House National Historical Park (established 1940)	972 acres, near Appomattox (state 24)	McLean farmhouse (replica), where Lee surrendered Confederate Army to Grant
Colonial National Historical Park (established 1930)	9,430 acres, near Williamsburg (U.S. 60)	Includes most of Jamestown, England's first permanent settlement in North America
Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park (established 1927)	8,190 acres, near Fredericksburg (U.S. 1)	Sites of the Civil War battles of Fredericksburg, Chancellorsville, the Wilderness, and Spotsylvania Court House
Richmond National Battlefield Park (established 1944)	691 acres, near Richmond (U.S. 60)	Several battlefields and defense works dating from the siege of Richmond (1865)
George Washington National Forest (established 1918)	827,739 acres stretching from Buena Vista northeast to Front Royal (Blue Ridge Pkwy.; state 6, 78)	Woodland scenery; many caverns in the vicinity
Thomas Jefferson National Forest (established 1936)	590,589 acres stretching from Pennington Gap northeast to Glasgow (Blue Ridge Pkwy.; U.S. 23; state 42)	Land once owned by Jefferson and surveyed by Washington; natural bridge; recreation area with lakes and trails
Douthat State Park (established 1906)	4,493 acres, near Clifton Forge, in the Allegheny Mts. (U.S. 60)	Recreation area: wildlife refuge
Fairy Stone State Park (established 1930)	4,561 acres, near Bassett (state 57)	Named after lucky, or fairy, stones found in the area; 168-acre lake; cabins, camping, fishing, hiking
Hungry Mother State Park (established 1936)	2,134 acres, near Marion (state 16)	Guest lodges and cabins; 108-acre lake; sailing, swimming, camping
Westmoreland State Park (established 1936)	1,282 acres, near Montrose (state 347)	Views of Potomac River; camping, swimming; birthplaces of Washington and Lee nearby



SCENES IN THE "OLD DOMINION"

Powell Valley (*above*) is typical of Virginia's serene and lovely countryside. Gunston Hall (*above right*), near Alexandria, was the home of George Mason, who played an important part in drafting the Bill of Rights. The World War Memorial (*right*), in Lynchburg, forms an imposing approach to the courthouse. The statue of Pocahontas (*below*), at Jamestown Island, honors the Indian princess who married John Rolfe in 1614. The Governor's Palace (*below right*) and other historic buildings in Williamsburg were restored to their 18th-century grandeur by John D. Rockefeller, Jr. (*photos courtesy Ewing Galloway*)



in with a cargo of Negroes from Africa. The Africans, who may have been indentured servants, were better suited to working under the hot Virginia sun than the colonists, and from that time on the Southern colonies came to depend more and more upon Negro labor. In the same year, the first representative assembly in the New World, the House of Burgesses, elected by the Virginia colonists, was convened. When Parliament seized control of the English government, the king's governor, Sir William Berkeley, remained in power in Virginia, and most Virginians sympathized with the king. Cromwell unseated Berkeley (1652), but he was restored to office when Cromwell himself fell.

In 1676 a long-standing quarrel burst into open revolt when Nathaniel Bacon led a rebellion against the now-tyrannical Berkeley. The settlers along the inland frontier had long resented Berkeley and the Tidewater families along the coast for not supporting them in their struggles against the Indians. Bacon's Rebellion, successful at first, was crushed when its leader died. Nevertheless, much of the discontent that eventually led to the Revolutionary War was first brought into the open in this revolt.

Virginia took a leading part in the series of crises that erupted into the Revolution. The House of Burgesses, dismissed in 1774 by the royal governor, met at the Raleigh Tavern in Williamsburg and called upon the 13 colonies to organize a Congress. In 1775 the Continental Congress gave George Washington, the most experienced officer of the colonies, command of the Continental Army. Six years later, on the Yorktown peninsula in southeast Virginia, an American army and a French fleet held the British in a trap. Unable to break out by land or by sea, Gen. Cornwallis surrendered on Oct. 19, 1781.

In answer to demands by Maryland, which hesitated to accept the new government, Virginia gave up its claim to the western lands, making possible the creation of new states beyond the Appalachian Mts. When government according to the Articles of Confederation proved too clumsy, it was Virginia which called two conferences that led to the adoption of a new Federal Constitution. Four of the first five Presidents were natives of Virginia; four other Virginia men later held the office of President.

On the eve of the Civil War, Virginia, although a slave state, was slow to leave the Union. In April 1861, however, when President Lincoln issued a call for troops, Virginia seceded. Robert E. Lee, probably the foremost officer in the army, was offered command of the Union forces by Lincoln. After an internal struggle, he threw in his lot with the Confederacy, stating that he could not bring himself to fight against friends and neighbors.

Some of the most important battles of the Civil War were fought in northern Virginia, between the Northern capital of Washington and the Confederate capital of Richmond. The Confederate efforts to break the Union blockade resulted in the battle between the ironclads, the *Monitor* and the *Virginia* (originally named the *Merrimac*). This battle, fought to a draw in the harbor of Hampton Roads, spelled the end of wooden warships. In a Virginia farmhouse near Appomattox Court House, the war came to a close with Lee's surrender (April 9, 1865). Virginia was readmitted to the Union in 1870.

In World War I, many soldiers received their training at camps in Virginia, while a Virginia-born college professor, Woodrow Wilson, was the nation's President. The state itself furnished 91,103 men and women to the armed forces. During World War II, another Virginian, Gen. George C. Marshall, was chief of staff of the U.S. Army. The nerve center of the nation's defense activities became a huge five-sided building called the Pentagon, located on the Virginia shore of the Potomac River, opposite Washington, D.C. The naval bases and shipyards along Virginia's coast contributed ships and trained sailors to win the war at sea. Virginia furnished 324,398 men and women to the armed forces during World War II.

Since the war Virginia has prospered economically. With more than a fifth of its civilian population now employed in manufacturing and less than a fifth in agriculture, Virginia has gradually become an industrial rather than agrarian state. Yearly income from all types of manufacturing now amounts to nearly four times that from crops and livestock.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Virginia, a city in St. Louis County, Minnesota, *ca.* 55 m. N.W. of Duluth. It is on the Great Northern, the Duluth, Missabe & Iron Range, and the Duluth, Winnipeg & Pacific R.R.'s. Located in productive iron-mining country, the city trades in merchandise, lumber, and dairy products and is a shipping point for iron ore. The nearby lakes attract thousands of visitors annually. It was settled in 1892 and incorporated in 1895. Population, 1950, 12,486.

Virginia Beach, a city in Princess Anne County, Virginia, 18 m. E. of Norfolk, on the Atlantic Ocean. It is served by the Pennsylvania, Chesapeake and Ohio, and other railroads. Principally a summer resort, it is also a commercial and fishing center and is located in a farming region. The first lighthouse in the U.S., completed in 1791, is nearby at Cape Henry (*q.v.*), which is also the site of Capt. John Smith's landing in 1607. Virginia Beach is also important for a naval air station and Ft. Henry, a military installation, which are both nearby. It was incorporated in 1906. Population, in 1950, 5,390.

Virginia City, a city in Nevada, seat of Storey County, 16 m. S.E. of Reno. In its early days it was a pioneer mining camp, and during its flourishing days gold and silver worth a billion dollars were extracted in the vicinity, chiefly from the famous Comstock Lode (*q.v.*). At one time Virginia City was one of the largest cities in the Far West, with a population of 35,000 in 1874-75. There are many historic buildings, including an opera house, and board sidewalks are still in use. Now a ghost town, it is visited by many tourists, and some artists and craftsmen have settled here recently. Settled in 1859, Virginia City was incorporated in 1864, but was later unincorporated. Population (of township), 1950, 603.

Virginia Creeper, a vine (*Parthenocissus quinquefolia*) of the grape family, which climbs by rootlets as well as by disk-bearing tendrils. In some regions it is called *American ivy* and *woodbine*. It differs from the poison ivy in having five-part leaves, while the latter has three-part leaves. Its greenish flowers are not conspicuous and are followed by dark blue berries, while the leaves assume a bright scarlet color in autumn. The plant is cultivated as an ornamental creeper on the fronts of houses, old walls, and over lattice work, often reaching heights of 30 to 50 ft.

Virginia Resolutions (*rĕz-ō-lū'shŭnz*), a set of resolutions adopted by the Virginia legislature in 1798 in opposition to the Alien and Sedition Acts of the Federal government. Written by James Madison (*q.v.*), they were similar to, but milder than, the Kentucky Resolutions (*q.v.*) in declaring the unconstitutionality of the Acts and supporting the theory of states' rights. Together with the Kentucky Resolutions, they were a precedent for the Southern doctrines of nullification and secession.

Virginia, UNIVERSITY OF, a state institution of higher learning at Charlottesville, Va., chartered in 1819. The institution was planned by Thomas Jefferson, who designed some of its buildings. It maintains departments of academic instruction, education, engineering, graduate studies, law, and medicine, and has a number of affiliated schools. The library has about 900,000 volumes. The annual student enrollment totals *ca.* 4,600, and there are some 535 members of the faculty. The physical plant is valued at more than $30,000,000.

Virgin Islands (*vûr'jĭn ī'lạndz*), BRITISH. See *Leeward Islands.*

Virgin Islands of the United States, a group of islands, politically an incorporated territory of the U.S., situated 60 m. E. of Puerto Rico. The total area is 133 sq. m., including the islands of St. Croix (80 sq. m.), St. John (20 sq. m.), St. Thomas (30 sq. m.), and about 50 small islets, mostly uninhabited. The exports consist chiefly of sugar and rum, and trade is almost exclusively with the U.S. There is also a large tourist trade, but otherwise the islands have little commercial value; their importance is largely as defense outposts for the Panama Canal and as a station for steamship lines crossing the Atlantic. Harbors are located at Charlotte Amalie, the capital, on St. Thomas, and at Christiansted, on St. Croix.

Formerly known as the Danish West Indies, the Virgin Islands were purchased (1917) from Denmark by the U.S. for $25,000,000. Congress granted the islanders U.S. citizenship in 1927, and a civil government was established under the Organic Act of 1936, superseded by the Act of 1954. The islands are divided into two municipal councils, of St. Thomas and St. John, and of St. Croix, respectively. These two councils combine to form the colonial legislature. Executive power is vested in a governor who is under the jurisdiction of the U.S. Secretary of the Interior. Population of the islands, largely Negro and mulatto, 1950, 26,665.

Virginius (*vĕr-jĭn'yŭs*), LUCIUS, Roman centurion, famous for slaying his daughter to prevent her coming under the influence of Appius Claudius Crassus. Writers have made the story a familiar theme in literature.

Virginius Massacre (*măs'ạ-ḳĕr*), the name given to the capture (Oct. 31, 1873) by a Spanish man-of-war, the *Tornado,* of a ship registered as an American merchantman. The *Virginius* was carrying men and arms to Cuba during the island's Ten Years' War with Spain. Joseph Fry, captain of the *Virginius,* and more than 50 of the crew and passengers were executed. The incident brought the U.S. and Spain close to war until Secretary of State Hamilton Fish undertook negotiations. It was shown that the ship was fraudulently registered under the American flag, and the matter was settled with the payment by Spain of $80,000 in indemnities.

Virgin Mary (*vûr'jin mâr'ĭ*). See *Mary* (the mother of Jesus Christ.)

Virgo (*vûr'gō*), a constellation and the sixth sign of the zodiac (*q.v.*), between Leo and Libra. Known from antiquity, the constellation is shown as a robed young girl holding an ear of grain and is identified with the harvest goddesses. The constellation contains Spica, a star of the first magnitude.

Virtanen (*vĭr'tä-nĕn*), ARTTURI ILMARI, biochemist, born in Helsinki, Finland, Jan. 15, 1895. He studied at the Univ. of Helsinki and received his Ph.D. degree in 1919. He joined the laboratory of the Butter Export Assn. at Valio in 1919, becoming its director two years later. He has remained in this position ever since, at the same time holding teaching and related research positions. He was elected president of the Acad. of Finland in 1948. Although almost unknown outside the Scandinavian countries, he won (1945) the Nobel Prize for chemistry for his discovery of a method of preserving most of the food value in cattle fodder. This method, widely known in Europe but little used in the U.S., is called, after him, the A.I.V. method. It was evolved from his researches on the utilization by the bacteria on legumes of nitrogen from the air, and on the destruction by other bacteria of the proteins made from this nitrogen. He discovered that silage spoils when it becomes alkaline and that such spoilage can be largely prevented by the application of acid to fresh fodder.

Virus (*vī'rŭs*), an ultramicroscopic, filterable particle, which still defies complete classification as to whether it is a living entity or a structured chemical compound; whether it is a plant, an animal, or an enzyme. It has been shown to consist of a protein shell around nucleic acid. The nucleic acid is the "heart" of the virus; different strains seem to depend for their differences on varying amounts of amino acids or on the presence of an altered acid. Viruses may range from simple nucleoproteins to large spheres, rods, and ellipsoids. All viruses have in common their ability to reproduce only within certain specific living cells; they can multiply only when feeding on a living cell.

Viruses can persist in their host for many generations in either an infectious or a noninfectious form. They can mutate (change) to form new strains and new disease entities. The conversion from a latent to an active state may be influenced by seasonal factors (*e.g.,* in infantile paralysis), hormonal balance of host (there is a greater susceptibility during pregnancy), and age or nutrition of host. Recovery is the general rule with most virus infections. Because of the intracellular life of the virus, specific treatment for viral diseases does not exist.

Viral vaccines prevent the spread of intact viral particles from cell to cell, but they cannot affect the intracellular virus.

At one time, a virus infection was diagnosed when no bacteria could be found, *i.e.,* by exclusion. Now, through tissue culture, positive identification can be made and, as a consequence, the list of the virus-caused diseases is steadily growing. The *Coxsackie* virus is a family containing more than 30 distinct types, causing aseptic meningitis, epidemic pleurodynia, herpes, etc. *ECHO* viruses, of which 20 distinct types have been isolated, produce diarrheal disease in infants and a type of respiratory disease. The *adeno* viruses, of which 18 types have been studied, produce pharyngitis, virus pneumonia, and acute eye and respiratory diseases.

Viruses are responsible for chicken pox, infantile paralysis, influenza, measles, mumps, and smallpox. Scientists believe they may also be a factor in the formation of cancer (*q.v.*).

Visconti (*vēs-kōn'tē*), a Lombardian Ghibelline family, which from 1277 until 1447 ruled Milan. The most important members of the family were (*1*) GIOVANNI VISCONTI, born in 1290(?); died in 1354. Archbishop of Milan and ruler of the city (1349-54), he annexed Genoa and Bologna, extending the possessions of his family over most of northern Italy. (2) GIAN GALEAZZO VISCONTI, born about 1351; died in 1402. Ambitious to reign over all Italy, he took Verona, Padua, Siena, Perugia, Lucca, and Bologna and bought Pisa. When he besieged Florence, he was stricken by the plague. He built the cathedral of Milan and the Certosa di Pavia; he also restored the Univ. of Piacenza and improved the Univ. of Pavia.

Viscosity (*vĭs-kŏs'ĭ-tȳ*), a fluid friction retarding the flow of fluids in pipes and tubes. The viscosity of fluids varies, being small for gases and large for liquids such as glycerin or molasses. Liquids of high viscosity flow through pipes at a slower rate than do nonviscous liquids or gases. The instrument for measuring viscosity is called *viscosimeter*. It is especially useful for measuring rates of flow of lubricating oils.

Vise (*vīs*), a tool that has two jaws constructed so as to hold tight any material while work is done upon it. The jaws are fitted with a screw or lever, by which the movable jaw may be pressed tightly against the fixed jaw, thus holding secure the material upon which work is to be done, as in filing. Carpenters, machinists, and others use vises in their workshops. See also *Screw*.

Vishinsky (*vĭ-shĭn'skȳ*), ANDREI JANUARIEVICH, Soviet official, born in Odessa, Russia, Dec. 10, 1883; died in New York City, Nov. 22, 1954. He studied law at Kiev Univ. In 1902 he joined the Social-Democratic Revolutionary group, and in 1905 he was made secretary of the Baku Soviet. He joined the Communist party in 1920 and in the same year was appointed to the Staff Commissariat for Food Supply, remaining at that post until 1923, when he became attorney general of the Russian S.F.S.R. In 1925 he was named professor of jurisprudence at Moscow Univ. From 1935 to 1939 he served successively as commissar for justice, deputy public prosecutor, and public prosecutor. In the last-named capacity he acted as state's attorney in the notorious "Moscow Trials," in which important officials were convicted for alleged conspiracy with the exiled Leon Trotsky (*q.v.*) to overthrow the government. In 1938 Vishinsky was named vice chairman of the Council of People's Commissars and in 1940, deputy commissar for foreign affairs. From 1943 to 1944 he was the Soviet Union's representative on the Allied Mediterranean Commission. He later served as a Soviet delegate to the U.N. and was a member of the Soviet delegation

Courtesy Keystone Pictures Inc.

ANDREI J. VISHINSKY

to the Paris Peace Conference concerning the German satellite nations. In succeeding years he took a major role in delineating the Soviet's position in the cold wăr with the Western Powers. He succeeded V. M. Molotov (*q.v.*) in 1949 as foreign minister, but, after Stalin's death in March 1953, was replaced by Molotov and again became the chief Soviet delegate to the U.N.

Vishnu (*vĭsh'nōō*), a figure in the Brahman trinity, representing the principle of preservation, in addition to Brahma (*q.v.*), the Creator, and Siva (*q.v.*), the destroyer. He is depicted in the form of an animal or half-animal, sometimes also with four arms holding a club, a shell, a discus, and a lotus. Sometimes he is described riding on a fabulous monster, the Garuda, half man, half bird. He develops many incarnations of which Krishna (*q.v.*) is one. As such, he is essentially the lover and hero and in the Bhakti-Marga (the Hindu sect which believes that salvation lies in devotional faith) becomes even the general redeemer. The Vishnu and Siva sects of Hinduism both recognize his redeeming faculties.

It is interesting to note that the adoration of Vishnu was sometimes identified with that of Buddha (*q.v.*) in order to reconcile the two religions. Vishnu's figure does not appear before or in the Vedas (*q.v.*). It is believed that originally he was a sun deity.

Visigoths (*vĭz'ĭ-gŏths*). See *Goths.*

Vision (*vĭzh'ŭn*). See *Eye; Visual Sensation.*

Visitation (*vĭz-ĭ-tā'shŭn*), in the New Testament, the story of the visit of the Virgin Mary to her cousin Elizabeth, the future mother of St. John. It was a favorite topic of medieval sculpture and has also been a theme for painters. The feast of the Visitation is celebrated on July 2.

Vistula (*vĭs'tū-lȧ*), a river of Europe, which rises in northern Austrian Silesia and flows toward the northwest into the Baltic Sea, its waters passing into the Gulf of Danzig. It courses through western Poland and eastern Germany. The length is 675 m., of which 550 m. are navigable. The Vistula has falls of 200 ft. in Silesia. Among the chief cities on its banks are Cracow, Warsaw, and Danzig. Its tributaries include the Bug, San, and Brahe. Canals connect it with the Oder, the Dnieper, and the Niemen.

Visual Education (*vĭzh'ū-ạl ĕd-ū-kā'shŭn*), a term used to describe methods in education involving the use of media of expression other than the written word. In a general sense, the term embraces such methods as the use of field trips, slides, scale models, motion pictures, still pictures, maps and charts, and auditory materials when used in conjunction with visual matter. However, the term applies to these methods only when they are employed as a means of instruction. When used in the development of a manual skill, they must be classed as vocational or graphic arts.

Visual education was first employed during the 18th century, with the use of illustrated textbooks. Gradually, the use of pictures, maps and charts in the classroom became widespread. But the adoption of the other methods mentioned above is a comparatively recent development, which has proved to be extremely successful. During World War II, visual education was used extensively in U.S. Army and Navy training courses, as a means of illustrating lecture material. As a result of the success of this program, public school curriculums have been expanded to include more visual educational material than in the past. See also *Education.*

Visual Sensation (*vĭzh'ū-ạl sĕn-sā'shŭn*), the name applied to the phenomenon of sight which causes the sensation of vision to be of greater duration than the actual stimulus. Such a sensation may be noticed in a flash of light, which lasts a shorter time than the time occupied by the light vibration acting on the retina. A single sensation is occasioned when two flashes occur near each other. To prevent fusion in the case of a strong light, the interval between the two must be more than 1/30th of a second, while in a faint light it must be more than 1/10th of a second. This is due to the fact that it is easier to distinguish differences of brightness between two faint lights than between two of great brilliancy, as between a dip and a wax candle, on the one hand, and two bright electric lights, on the other. Many double stars seen with small telescopes appear as single ones, and that two stars exist can be proved only by the more powerful instruments. When the distance between two stars subtends an angle less than 60 seconds, most people see them as one. Sensations of color depend on the wave length of the rays falling on the retina in a given time, as well as on the amount of white light falling on the same retinal area at the same time. The colored light sensations are diluted by the white light. Red, green, and violet are the three primary colors which cause retinal sensations.

Vitalism (*vī′tạl-ĭz′m*), a term used in biology and philosophy. In the first case it expresses the concept that phenomena exhibited in living organisms are due to a special force distinct from physical and chemical forces; in the second case, it states the principle that phenomena are opposed to mechanical forces by being primarily self-determining.

Vital Statistics (*vī′tạl stȧ-tĭs′tĭḳs*), a compilation of data concerning births, deaths, marriages, and divorces. In the U.S., vital statistics, including related data on communicable diseases, mental health, medical care, hospitals, and nutrition, are collected by an office of the Public Health Service (P.H.S.), U.S. Dept. of Health, Education, and Welfare. The data are published in periodical and special reports compiled from statistics made available by the states and from special sample surveys.

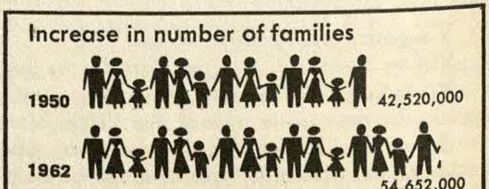
The collection of birth statistics began with 10 states and the District of Columbia in 1915. After 1933 birth statistics were collected from all the states, and the P.H.S. office has been currently basing its reports on a 50 per cent sample of all registered births with adjustments being made for under-registration. In 1960 a total of 4,247,000 births were registered throughout the U.S., and the crude birth rate was provisionally estimated to be 23.6 per 1,000 population. In 1959, 4,244,000 births were registered, and the estimate of total births after adjustment for under-registration was 4,295,000. The crude birth rate estimated for 1959 was 24.3 per 1,000. In recent years, the birth rate ranged between a high of 25.3 per 1,000 (1954 and 1957) and a low of 23.6 (1960). The post-World War II birth rate, which reached a peak in 1947 (25.8 births per 1,000), was higher than the birth rate during the depression decade of the 1930's or the war years of the early 1940's. The birth rate from 1930 to 1945 ranged between a high of 22.7 per 1,000 (1943) to a low of 18.4 (1933 and 1936). The highest birth rates were reported for the early years of the century; for example, the birth rate was estimated at 30.1 in 1910, 29.5 in 1915, and 27.7 in 1920. Illustrating a consistent trend, the nonwhite birth rate in 1959 (34.1 per 1,000 nonwhites) ran higher than the rate for whites (23.1 per 1,000 whites). More male babies consistently are born than females, the 1959 proportion being 1,049 males for every 1,000 females.

Compared with the U.S. birth rate, the 1960 birth rates reported for Great Britain and such western European countries as The Netherlands, West Germany, France, and Italy were low, ranging from a high of 20.8 per 1,000 in The Netherlands to a low of 17.2 in Great Britain. Reflecting the impact of a birth-control program, Japan's birth rate fell from an average rate of 30.1 reported for the years from 1945 to 1949 to 17.2 in 1960.

Death statistics were collected on an annual basis from ten death-registration states and the District of Columbia after 1900. Since 1933 the entire U.S. has been included in the death-registration area, and the P.H.S. office currently bases its reports on a 10 per cent sample of all death certificates filed in state vital statistics offices. Its reports indicate that the U.S. death rate has gradually declined from 17.3 per 1,000 population in 1900 to 9.5 in 1960. The death rate is higher for U.S. nonwhites (10 in 1960) than for whites (9.4), and higher for males (10.9) than for females (8.0).

The ten leading causes of death, accounting for *ca.* 85 per cent of all deaths in 1959, were diseases of the heart, cancer and other malignant tumors, vascular lesions affecting the central nervous system, accidents of all kinds, certain diseases of early infancy, influenza and pneumonia, arteriosclerosis, diabetes mellitus, congenital malformations, and cirrhosis of the liver. The great progress that medical science has made in preventing diseases and premature death and the generally improved standard of living have extended the life of Americans. One way of measuring this progress is by statistics compiled on the expectation of life (*q.v.*).

Marriage and divorce statistics have been collected nationally for selected years over the last century (1867-1906, 1916, 1922-32, 1937-40, and from 1944 on). In the late 1950's the national office established a marriage-registration area (35 states and three other areas) and a divorce-registration area (20 states and one other area) to refine its collection of data. According to provisional 1960 figures, there were 1,527,000 marriages and 395,000 divorces throughout the U.S. The 1960 marriage rate was 8.5 per 1,000 population, and the divorce rate was 2.2. Both marriage and divorce rates declined somewhat over the decade of the 1950's, the highest marriage rate (11.1 per 1,000) and the highest divorce rate (2.6) for the decade being reported in 1950. The



Graphics Institute, N. Y.

highest marriage and divorce rates ever reported since data were available occurred in 1946, when there were 16.4 marriages per 1,000 population and 4.3 divorces. See also *Census; Population.*

Vitamins (*vī′tȧ-mĭnz*), complex organic compounds, occurring in natural foods and essential to the normal physiological functioning of living bodies. The word is derived from the Latin word *vita,* meaning "life." The vitamins occur in natural, unrefined foods in minute amounts, but despite the smallness of the amounts essential to nutrition, a complete deficiency of any one of them causes serious illnesses. Daily requirements of any vitamin vary according to climate, individual conditions, and degree of activity. All of the vitamins play some part in normal growth and health.

It was known as early as 1720 that the basic food constituents, such as proteins, fats, carbohydrates, and minerals, were deficient in some needed factor to prevent scurvy (now known to be caused by lack of vitamin C), and at that time fresh vegetables and fruits were recommended as a preventive. About 1911, several vitamin complexes became known as fat-soluble factors and water-soluble factors. The former included vitamins A and D, the latter vitamins B_1, B_2, and C. Since then, about 15 individual vitamins have been isolated, and the amounts of some of them which are necessary to human health have been determined. A large variety of foods have been studied to establish their normal vitamin content. Much research has been completed on six vitamins. The foods containing these also contain other less-understood vitamins, but if the requirements of the known six are cared for by eating natural foods containing them, the need for the less-known vitamins will be supplied at the same time. This is one of the reasons why vitamin requirements should generally be supplied by the use of natural foods, rather than by the substitution of the pure chemical form of one or more vitamins.

The Vitamin Standardization Committee of the League of Nations assigned units to measure the vitamin activity of various foods. These are called "International Units" and are used for vitamins A, B_1, C, and D. The U.S. Pharmacopoeia units, known as "U.S.P. units," have the same values. Vitamin requirements are usually given by weight except for vitamins A and D which are usually stated in International or U.S.P. units. The International or U.S.P. unit by weight for vitamin A equals 0.6 microgram of beta-carotene, and for vitamin D, 0.025 microgram of the crystalline form. The International or U.S.P. unit for vitamin B_1 represents 3 micrograms of thiamine chloride; for vitamin C, 50 micrograms of ascorbic acid.

The better-known vitamins with their food sources are listed below. Food sources are assumed to represent a normal serving, which will supply ⅕ to ½ the daily requirement; where milk is included, it is based on the consumption of at least one pint. The term "excellent source" has been defined by the U.S. Dept. of Agriculture to mean any food which provides 50 per cent or more of the daily requirement of a nutrient per usual serving portion.

Vitamin A ($C_{20}H_{30}O$). This vitamin is essential for normal vision and for the health of the skin tissues both internal and external, and for normal growth of bones and teeth. Normal daily requirements are 5,000 International or U.S.P. units, but it is stored in the body to provide for temporary deficiencies in the diet. Carotene and cryptoxanthin, which are yellow or orange-colored pigments occurring in many plants, are converted in the body to vitamin A and serve as food sources for vitamin A. Excellent sources are the leaves of green plants, such as lettuce, dandelion, broccoli, green cabbage, kale, etc.; carrots, yellow sweet potatoes, red pimento peppers, tomatoes, tangerines, green peas, egg yolk, liver of animals and fowls, cheddar or cream cheese, milk, fish liver oils, and butter. Inadequate absorption of vitamin A may occur in cases of tuberculosis, certain intestinal diseases such as colitis, in jaundice, in fat-free diets, and in case of excess use of mineral oil.

Vitamin B_1—Thiamine Chloride ($C_{12}H_{18}N_4OSCl_2$). This vitamin is necessary to oxidize pyruvic acid in the body and thus to prevent toxic conditions resulting from the accumulation of pyruvic acid in the tissues. It protects nerve tissues and promotes normal appetite and digestion. Daily requirements depend in part on the amount of carbohydrate food ingested, but 1.0 to 1.5 milligrams are a good average. There is little storage of this vitamin in the body. Excellent sources are soy beans, peanuts, dried yeast, pork (lean), lima beans, whole grains such as barley, oats, and rye, green peas, egg yolk, whole wheat or enriched bread, rice polishings, wheat germ, and dried skim milk. The classical severe vitamin B_1 deficiency disease is *beriberi,* characterized by loss of appetite and weight, nausea, constipation, nervousness, fatigue, weakness, numbness and tingling of the extremities, mental depression, and finally enlargement of the heart, shortness of breath, and swelling of the extremities. Alcoholic neuritis is due to B_1 deficiency, accompanying severe and prolonged alcoholism.

Riboflavin ($C_{17}H_{20}N_4O_6$). This vitamin acts together with vitamin B_1 in the oxidation processes of the body. The daily requirement is from 2.0-3.0 milligrams. Excellent sources are dried yeast, eggs, kidney, liver; beet, kale, or turnip greens; mackerel, oysters, fish roe, lean meats, peanuts, milk, skimmed milk, and buttermilk.

Deficiency of riboflavin is indicated by cheilosis (cracks at the corners of the mouth), dermatitis of face and scalp, inflammation of the tongue, and itching, burning sensations, and inflammation of the eyes.

Niacin or *Niacin amide. Nicotinic acid* or *nicotinic acid amide* ($C_6H_5NO_2$ or $C_6H_5NO_2.NH_2$). Part of the B-complex. Complete lack of this vitamin causes the disease of dietary deficiency *pellagra,* which is characterized classically by the triad of "diarrhea, dermatitis, and dementia." Niacin is essential to tissue respiration. The daily requirement depends on the degree of activity; an average estimate is 15-23 milligrams per day. Good sources are liver, kidney, lean meats and poultry, peanuts, dried yeast, whole-grain breads, fish, dried peas and beans, soy beans, and cheese.

Vitamin C—Ascorbic acid ($C_6H_8O_6$). This vitamin is essential for the maintenance of the body cells. Lack of it produces scurvy, a disease which is accompanied by disintegration of the bones, capillaries, and teeth. This vitamin is not stored in the body and must be supplied by the daily food. The daily recommended allowance is 75 milligrams. Excellent sources of vitamin C are green vegetables, citrus fruits, tomatoes (either canned or fresh), green and red peppers, avocados, melons, string beans, and potatoes.

Vitamin D—Activated 7-dehydro-cholesterol ($C_{27}H_{43}OH$). *Activated ergosterol* ($C_{28}H_{43}OH$) *and several other sterol derivatives.* Vitamin D, the anti-rachitic factor, is produced in the body itself by exposure to sunlight, without resorting to food sources. Where insufficient sunlight is secured, Vitamin D may be obtained from viosterol, calciferol, etc., or from the foods listed below. The daily requirement is 400 International or U.S.P. units. This vitamin regulates the metabolism of calcium and phosphorus in the body, and its omission causes rickets, soft bones and teeth. Food sources are fish, irradiated milk, eggs, liver, cod liver oil, etc. The need for vitamin D is especially great during infancy, childhood, pregnancy, lactation, and certain chronic diseases.

Other vitamins of which less is known, but which occur in many of the foods listed above, are: *Pyridoxine* ($C_8H_{11}NO_3$), or vitamin B_6, another of the group of B vitamins, or B-complex, widely distributed in plant and animal tissues; *Vitamin E—alpha-tocopherol* ($C_{29}H_{50}O_2$), considered necessary for reproduction in some species, found in green vegetables, milk, whole-grain cereals, peanuts, and eggs; *Pantothenic acid* ($C_9H_{17}NO_5$), lack of which causes dermatitis and gray hair in laboratory animals, and which is found in seeds, yeast, liver, and many other sources (the name "Pantothenic" means "from everywhere"); *Vitamin K,* or the "antihemorrhagic vitamin" (*derivative of naphthoquinone*), required for blood clotting, found in green vegetables and liver, lack of which in pregnancy may result in hemorrhagic disease in the newborn; *Biotin* ($C_{10}H_{16}N_2SO_3$), needed in cell development, and found in seeds, nuts, liver, and eggs; *Inositol* ($C_6H_{12}O_6$), required by tissues, and found in cereal grains, green vegetables, and citrus fruits; *Folic acid* ($C_{19}H_{19}N_7O_6$), essential for normal metabolism of growing cells and tissues, and found in salmon, beef liver, wheat germ, dried lima beans, roasted peanuts, and spinach. *Vitamin* B_{12} has been shown to be one of the anti-anemia factors derived from liver.

To obtain the maximum vitamin content from foods, they should be eaten raw, canned, or cooked in small quantities of water and promptly served. Long, slow cooking destroys vitamin C and affects the quality of other vitamins. The canning of foods under pressure prevents the oxidation of much of the vitamin content. The refining of flour and rice removes the natural vitamin content from these foods, but in breads made from white flour, some B vitamins have been restored synthetically to improve their nutritive value. See also *Bread.*

Many people exhibit various grades of vitamin deficiency even when their diet is thought to be adequate. When the intake of one vitamin is insufficient, it is likely that the intake of related vitamins is insufficient as well. Such conditions should be treated by a physician with proper vitamin supplements. See also *Agriculture:* Food and Nutrition.

Vitascope (*vī'tạ-skōp*), or KINETOSCOPE. See *Moving Pictures.*

Vitebsk (*vē-tĕbsḳ'*), capital of Vitebsk region of the Byelorussian (or White Russian) S.S.R., on the Dvina River, 380 m. s. of Leningrad. It is in an agricultural region and manufactures machinery, clothing, and shoes, and processes lumber and flax. Known since the 11th century, Vitebsk became part of Lithuania in 1320, of Poland about 200 years later, and in 1772 of Russia. It was occupied by the Germans in both World Wars. Population, *ca.* 167,500.

Vitoria (*vē-tō'rē-ä*), or VITTORIA, a city of Spain, capital of the province of Alava, 30 m. s. of Bilbao, on the Zadorra River. Vitoria has figured more or less prominently in several wars, especially in 1813, when Wellington gained a decisive victory over the French here. Population, *ca.* 55,000.

Vitreous Humor (*vĭt'rē-ŭs hū'mẽr*), in anatomy, the glassy fluid substance comprising the body of the eye behind the lens.

Vivisection (*vĭv-ĭ-sĕḳ'shŭn*), a term which in present-day usage may be accurately defined as the practice of using a live animal to determine any fact or hypothesis in physiological research. This is distinct from *autopsy,* in which findings are made only from dead human or animal bodies. Originally, vivisection meant the cutting of the living body of an animal. This original definition must undergo re-interpretation since cutting and surgical experiments now form a very small part of the work undertaken. Animals may be inoculated with bacterial or serous injections, studied for reactions to various temperature and atmospheric changes, tested as to the effects of certain foods, and their responses to various drugs and chemicals. Since nothing is to be gained by the infliction of pain, and, indeed, many experiments may be invalidated by its appearance, anesthesia is used whenever needed. The most commonly employed test animals are the rat, guinea pig, monkey, dog, and rabbit.

A great deal of propaganda has been directed against vivisection. The principal argument is that man is not morally justified in profiting by experiments on lower animals. The Anti-Vivisection Movement was started in England in 1874 by Frances Power Cobbe, and in 1876 the Society for the Protection of Animals from Vivisection was founded in London. The movement spread to the European continent, and in 1883 the American Anti-Vivisection Society was organized in Philadelphia under the auspices of Mrs. Caroline Earle White. The solid weight of medical opinion holds that the practice of vivisection is absolutely necessary to the advancement of scientific knowledge. This school of opinion points to the antitoxin treatment of diphtheria, the prophylactic vaccine inoculation for typhoid and paratyphoid, and the insulin treatment of diabetes as discoveries which could not have been made without the use of test animals. There is no legislation thus far prohibiting animal experimentation. However, in the States of Maine, Massachusetts, and Illinois vivisection is prohibited in the public schools.

Vizier (*vĭ-zēr′*), or VIZIR, a title given to high officials in some Mohammedan countries. The term was first used as a title of the prime minister and was conferred by Amulath I on Gen. Timurtash in 1386.

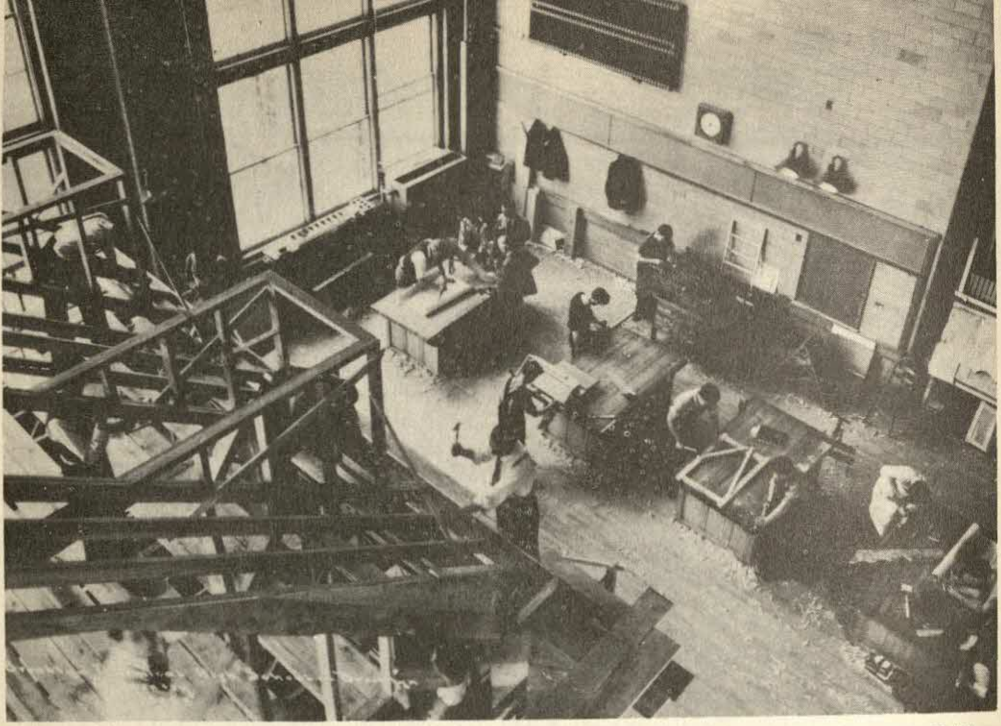
Vladimir (*vlăd′ĭ-mĭr*), called *The Great,* first Christian Emperor of Russia. He became Prince of Novgorod on the death of his father, in 972, but succeeded to the sole government of Russia, in 980, and reigned successfully until his death in 1014. Though a heathen at the time he ascended the throne, he became converted to Christianity, and was received into the Greek Church by baptism at Constantinople in 988. Many benefits were bestowed upon Russia during his reign of 35 years. He built churches, established schools, reformed the civil service, and laid the foundation for a powerful nation in the northern part of Europe. The Russian Church bestowed upon him the epithet of saint.

Vladivostok (*vlȧ-dĭ-vŏs-tôḳ′*), naval station and seaport on Peter the Great Bay, Sea of Japan, in the Russian Socialist Federated Soviet Republics (R.S.F.S.R.) of Asiatic Russia. It is near the Korean frontier and forms the eastern terminus of the Trans-Siberian R.R. The harbor is well sheltered and commodious, ranging in depth from 30 to 75 ft., but the intense cold of winter would make it icebound for a number of months were it not for ice-breakers. The city is the chief naval station of Russia on the Pacific, having naval workshops and strong battery defenses, and its extensive transportation facilities make it a commercial center of importance. It has a university, technical schools, two naval schools, scientific and educational societies and excellent elementary schools. It has a number of churches and hospitals. Vladivostok is important for its numerous machine shops and dry docks. Among the manufactures are lumber products, utensils, and cured fish. During World War I, in August 1918, Allied troops were sent to Vladivostok under the command of the Japanese Gen. Otani. Their purpose was to aid Czech units which were then fighting the revolutionists, as well as to salvage huge quantities of Allied war stores which had been accumulated for Russian use. Population, *ca.* 200,000.

Vocational and Technical Education (*vô-ḳā′shŭn-ạl and tĕḳ′nĭ-ḳạl ĕd-û-ḳā′shŭn*), specific training in the arts or sciences in direct preparation for a career or a vocation that utilizes such knowledge and skill. Schools which make vocational education a direct object are frequently divided into two general classes, those giving instruction in working trades, such as carpentry, watchmaking, tanning, decorating, engraving, and dyeing, and those which train for the commercial trades, which have to do with the retailing of merchandise, etc. With the former are included the trade schools that train craftsmen for practical work at any trade. There is also technical training on a higher level, such as institutes of technology, engineering schools, polytechnic institutes and schools of applied science.

Much technical instruction is given in many colleges and universities that do not make training for the arts and trades a direct object, but the utility of giving students some such training has become more generally accepted since trades have become more closely organized and the branches of work in the industries have been specialized. Industrial development and improved techniques have given emphasis to the importance of this training, and it has come to be an established fact that a theoretical knowledge of principles is necessary in addition to mere manual dexterity.

Technical education reached its highest degree in Europe. Noted institutions of this class are the School of Silk Weaving, Zurich, Switzerland; the



Courtesy All The Children

VOCATIONAL EDUCATION

High school students building a full-size bungalow as a part of their course in architecture and construction

Advanced School of Weaving, Lyons, France; and the textile department of the Manchester Technical School, England. Schools in which carpentry and other building trades are taught are quite numerous in Germany.

Until the middle of the 19th century, schools of applied art were not numerous in Canada and the U.S., but since then there has been a growing sentiment in favor of training for the handicrafts. Most states have made provisions for vocational training in the public schools. The Cooper Union of New York City (founded 1859) is one of the most prominent institutions affording practical application of design and theories preparatory for commercial pursuits and the working trades. Others of a similar class include the Drexel Inst., Philadelphia; the School of Industrial Art of the Pennsylvania Museum; the Maryland Inst., Baltimore; the Lowell School of Design, Boston; the Art Acad., Cincinnati; the Chicago Art Inst., Chicago; and the New York Trade Schools, New York. A number of colleges teach the essentials of agriculture and mechanical arts. In quite a number of cities night schools or part-time schools are maintained at which provision is made for those who are occupied during the day. These evening industrial classes are especially widespread in the U.S. and Great Britain.

In the field of higher technical education, including all forms of engineering and science, the U.S. has produced institutions bearing wide recognition. Among these are Rensselaer Polytechnic Inst., Troy, N.Y.; the Sheffield Scientific School of Yale Univ., New Haven, Conn.; the Mass. Inst. of Technology, Cambridge, Mass.; Stevens Inst. of Technology, Hoboken, N.J.; School of Mines, Columbia Univ., New York City, and others.

Vocational training in the U.S. is also fostered by special classes in such organizations as the Y.M.C.A., Y.W.C.A., and others. Industrial organizations, too, offer courses for the advancement of workers. During World War II the increased demand for specialized workers, such as welders, brought about establishment of many industrial schools, operated under public auspices. The aircraft industry has been instrumental in establishment of many schools in its field. American associations which specialize in promotion of industrial arts include the American Inst. of Mining Engineers, the Society of Naval Architects and Marine Engineers, the Society for the Promotion of Engineering Education, and the American Vocational Assn. The Young Men's Christian Assn. and similar societies maintain vocational service centers which are open to the general public. See also *Industrial School; Vocational Guidance.*

Vocational Guidance (*vô-ḳā'shŭn-ạl gīd'-ạns*), the accepted method of determining what profession or occupation will best suit an individual on the basis of his or her specific traits, characteristics, and skills.

Individualized analysis as well as complete occupational research provide the two basic sets of facts with which the expert in vocational guidance must work. In order to get a complete insight into his subject the expert in vocational guidance gives him a series of psychological tests which are capable of measuring his intelligence quotient, knowledge of specific subject matter, specific skills, aptitudes, interests, and other abilities and tastes. A comprehensive survey of all industries and professions is then made to determine just which of these specific skills and traits are characterized by the most successful practitioners in each field. With these two sets of facts, the expert in vocational guidance can then tell for what type of work his subject is best suited. First started in 1908 by Frank Parsons of Boston, vocational guidance has been expanded until it is now considered a regular part of the curriculum in many educational institutions.

Vogler (*fō'glẽr*), GEORGE JOSEPH, organist and composer, born in Würzburg, Germany, June 15, 1749; died May 6, 1814. He studied at Bamberg and Mannheim and afterward went to Rome, where he was ordained priest in 1773. He became a knight of the Golden Spur and was made chamberlain to the Pope. In 1775 he returned to Mannheim, where he became court chaplain, but soon opened a school of music. In 1780 he made an extensive tour of Southern Europe. Later he visited remote districts of Asia and Africa, and traveled through the northern part of Europe. He was made kapellmeister to the King of Sweden in 1776. At Stockholm he founded a second music school and attained much fame by performances on an instrument called the *orchestrion,* a kind of organ invented by him. Louis I, grand duke of Hesse-Darmstadt, appointed him kapellmeister at his court in Darmstadt, in 1807, and paid him a princely salary. While at Darmstadt he opened his third and most famous music school, in which such celebrated musicians as Weber, Gansbacher, and Meyerbeer received instruction. Vogler produced a large number of compositions and had an extensive influence on the music of Europe.

Vogt (*fōkt*), CARL, naturalist, born in Giessen, Germany, July 5, 1817; died May 6, 1895. After studying chemistry at Giessen under Liebig, he took a medical course at Bern and attended lectures on natural history delivered by Agassiz. In 1847 he became professor of zoology at the Univ. of Giessen, but his zeal in the revolution of 1848 lost him his position, and he was made professor of geology at the Univ. of Geneva. That position he held until his death. Vogt exercised a wide influence in the study of natural sciences and wrote a number of valuable works. He made an expedition to North Cape in 1861, and was chosen a member of the Swiss national assembly in 1878. His first writing was done in 1839, when he assisted Agassiz in preparing the first two volumes of "Natural History of Fresh Water Fishes." The independent works of Vogt include "Physiological Letters," "Essays on the Darwinian Theory," "Lectures on Man," and "Descriptive History of the Mammals."

Voice (*vois*), the sound produced by the vocal organs of a man and nearly all higher vertebrate animals. The larynx is the organ of voice in man. It consists of the expanded upper end of the trachea, or windpipe, and is connected with the hyoid bone or cartilage. An opening, the glottis, connects the larynx with the pharynx. Within the framework of the larynx are two thin, elastic bands, extending from front to rear, called the *vocal cords.* They are not really cords, but merely elastic membranes projecting across the opening. The membranes spread apart and leave a V-shaped orifice when not in use, and through it the air passes to and from the lungs. The edges approach each other when the cords are tightened, thus bringing them within 100th of an in. of each other. When air is expelled or driven out through the glottis or opening between the vocal cords, they are thrown into vibrations and cause corresponding vibrations in the current of air. It will be seen from this that sound of the voice is produced by vibrations, like the tone of a violin or an accordion, though the vocal cords are scarcely 1 in. long.

Vocal sound is made only when the cords are less than one-tenth of an in. apart, and the different tones of the voice depend upon the width of the opening and the tension of the cords. When the cords are short, tight, and closely in contact, the higher tones of the voice are produced, while the opposite conditions cause the lower tones. Loudness depends on the strength of the expiratory current, and quality depends chiefly on the physical structure of the cords. The female voice has a higher pitch than that of the male, due to the fact that the cords of the latter are longer. At about the age of 14 the larynx of boys enlarges and the cords grow proportionately longer and coarser; hence, the voice becomes about an octave lower and is said to *change* or *break.* The voice changes somewhat in old age, when the muscles that move the cords lose their elasticity. Soprano, tenor, and baritone voices depend respectively on the length of the cords, but all voices are modified to some extent by the form of the throat, mouth, nose, teeth, and lips. While many animals have voice, man alone has speech, which differs from voice in that it is a modulated form through whose agency ideas are expressed.

Though commonly associated with voice, speech may be effected without the voice, as in whispering, which is speech without the employment of the vocal cords. It is produced principally

Courtesy Australian News & Information Bureau, N. Y.
ERUPTION OF A VOLCANO

by the tongue, teeth, lips, and breath. *Lisping, stammering,* and *stuttering* are due more largely to the organs that modify speech than to the vocal cords. This is especially true of stammering, which is caused by irregular action of the nerve centers. The faculty of speech is natural, but it may be greatly improved by careful exercise. Vowel and consonant tones make up the two classes of articulate sounds. The vowel sounds are generated in the larynx. They consist of pure vocal tones, modified by the pharynx, mouth, and lips, and attain a nasal quality when the back entrance to the nostrils is not closed. The consonants are formed above the vocal cords, *labials* being made by the lips, *linguals* by the tongue, and *dentals* by pressing the tongue against the teeth. The strength of the voice depends on the resonance of the chest, lungs, and larynx, as well as on the vibration of the vocal cords.

Voivode (*voi'vōd*), a Slavonic title, applied in eastern Europe to various officials, but best known as the title of the princes of Moldavia and Wallachia. A district of northern Yugoslavia is known as the "Voivodina."

Volapük (*vō-lä-püḳ'*), an artificial language invented for international use in 1878 by Johann Martin Schleyer, a German priest of Constance, Switzerland. He was a diligent student of philology and was acquainted with 50 different languages. Volapük means *world speech* and was compounded from two words in the new language, *vol* meaning world and *püḳ* meaning speech or discourse. It was the author's aim to construct a language without irregularities in grammar, orthography, pronunciation, and syntax, thus making the new language regular and easy to learn.

In Volapük the sounds are represented by 37 letters. To the five pure vowels are added the German *umlauts,* which are placed over a, o, and u, thus, ä, ö, and ü. The chief advantage of the language is that it may be learned in a few weeks. Schleyer published a grammar and dictionary of it in 1880, and about 2,000 books have been written in Volapük. Although the language at one time was studied by many, its popularity was exceeded by that of Esperanto (*q.v.*).

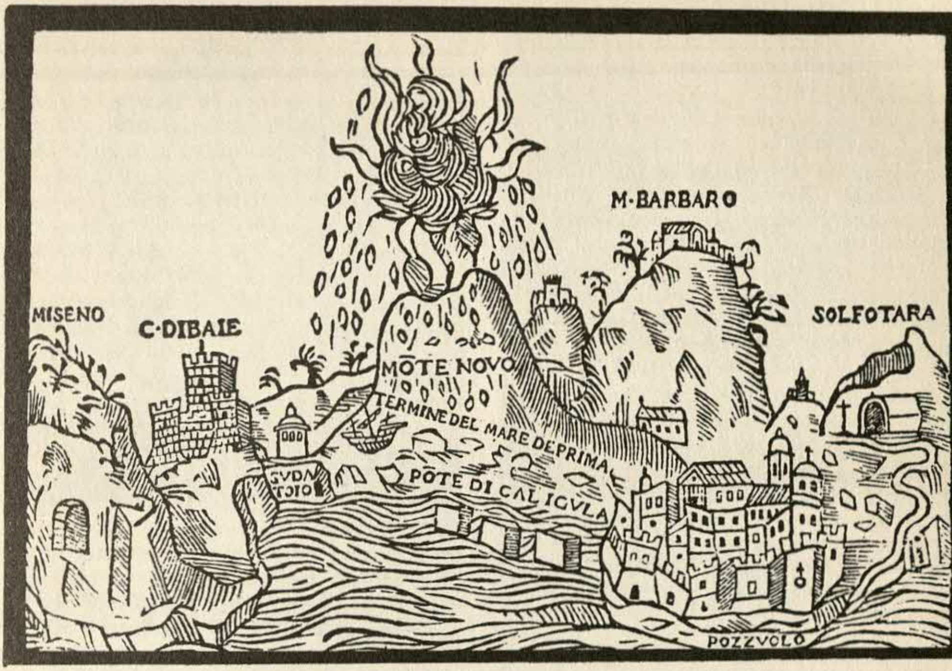
Volcano (*vŏl-ḳā'nô*), the name given to a hill or mountain which has been formed by the piling up of ejected, once liquid, stony matter from beneath the earth's surface. At the summit or on the flanks will be found one or more depressions, known as the craters, surrounding the throat through which the material came.

In geological terms, volcanoes are short-lived, though viewed in terms of human life most seem very ancient. Some of the world's greatest mountains are of volcanic origin, including the Mexican peaks of Orizaba and Popocatapetl, Japan's Fujiyama, Mauna Loa in Hawaii, and Mt. Rainier, in the U.S. Volcanoes are termed either active or dead, but the transition from one to the other is never certain. The ancient mountain which destroyed Pompeii in A.D. 79 was considered dead, but since that date it has been the active volcano Vesuvius, and has been in frequent eruption. Sudden renewals of activity have been responsible for great losses of life, as in 1902, when Mt. Pelée killed all 30,000 in St. Pierre, Martinique.

The world's volcanoes differ in their products and in the character of their activity. This difference leads to very different silhouettes. Volcanoes which produce fluid lava in quantity but without many great explosions tend to build up long, gentle slopes, like those in the Hawaiian Islands. Less free-flowing lava builds steeper cones, and viscous lava and large quantities of solid blocks, called volcanic bombs, pile up into steep cones, largely composed of unconsolidated material piled at the angle of rest. Such a cone is the small and active cinder cone, now known as Paricutín and about 1,500 ft. in height, which commenced to grow in 1943 in western Mexico.

The character of the rock products varies from place to place and through geologic time, presumably as different levels beneath the earth's crust are tapped as lava reservoirs. The very fluid lavas solidify to form basalt, a dark, iron-rich, and heavy rock. Lavas with more silica, more common in past geologic time than today, flow less freely and build steeper piles of lighter-colored rock.

The immediate cause of volcanic explosions is gas which accompanies the molten lava to the surface. Most of this gas is water vapor; the rest is, in part, carbon dioxide, ammonium chloride, and sulfur dioxide. The nature and proportions of the different gases also vary with the different cones and at different periods in their lives.



16TH CENTURY WOODCUT OF MT. VESUVIUS IN ERUPTION

Geologists still speculate as to the fundamental causes of vulcanism. Some think it may be caused by local superheating as radioactive elements in the earth's crust disintegrate; others think it is caused by crustal movements. The true answer may be still far in the future.

The hypothesis of crustal movement is strengthened by the distribution of volcanoes. The margins of the Pacific Ocean are dotted with volcanic peaks, from southern Chile through North America, Alaska, the Aleutians, Japan and the Philippines, finally dying out in the Dutch East Indies and New Zealand. They are surely related to many of the earthquakes, for the zones of earthquake foci are identical in distribution. North America's west coast lies within a volcanically active belt, and California, Oregon, and Washington have their share of volcanic cones. Lassen Peak, in northern California is America's most recently active volcano. It last erupted spasmodically during the first two decades of the 20th century. Hot gases still escape from vents in Mt. Hood and Mt. Rainier. The Aleutian Islands off the Alaskan coast have many active volcanoes. Isolated volcanoes are found on islands in the Pacific, while several other belts cut across the East Indies and the Mediterranean. All of these areas are centers of active earth movement, graphic proofs that though the earth is mantled with a solid crust, it is not finished, and that tremendous forces are still at work within, molding and shaping the surface on which we live today, just as they have been doing since the earth was first formed.

Vole (*vōl*), any of the genus of rodents called *Microtus,* which belong to the same family as the muskrat and the lemming. The name is not used extensively in America, where similar animals are popularly called *field mice.* Several species of these animals are found in Europe and America. The *field vole,* known locally as the *short-tailed field mouse,* is about the same size as the common mouse, but has a stouter body and the tail is somewhat shorter.

Volga (*vŏl'gạ*), the longest and one of the most important rivers of European Russia, and the longest river in Europe. It rises in the Valdai Hills of north central Russia and flows *ca.* 3,000 m. to the Caspian Sea, draining an area of 560,000 sq. m. Its tributaries include the Oka, Sura, Vetluga, Kama, Tvertsa, Mologa, Kostroma, and Unzha rivers. By canals it connects with the White, Baltic, and Black seas; the Gulf of Finland; the Dvina, Dniester, Dnieper, and Don rivers; and the city of Moscow. Dams and hydroelectric plants provide power, irrigation, and flood control; and the river is the base of a large fishing industry. It is not navigable during the winter. Always a major transportation artery, the Volga was instrumental in making possible the Tartar conquest of Russia, as well as Russian colonization and trade to the East. Catherine II settled German families in the area of the lower Volga, and in 1924 a German Volga Republic was organized within the Russian S.F.S.R. During the German invasion in World War II, it was dissolved as a security measure and divided among other regions.

Volgograd (*vŏl'gô-grăd*), a city in southeastern Russian S.F.S.R., capital of Volgograd oblast (region), on the Volga River, *ca.* 280 m. from its mouth. It is a major river port and rail center, shipping lumber, fish, and petroleum. Its manufactures include tractors, steel, petroleum and lumber products, and foods. Founded in 1589, the city was first called Tsaritsyn. In 1925 it was renamed Stalingrad, but during the period of de-Stalinization after the death of Joseph V. Stalin (*q.v.*), it was renamed Volgograd in 1961. It was the site of the battle of Stalingrad (*q.v.*). Population, 1959, 591,000.

Volley Ball (*vŏl'ȳ bạl*), a game played by volleying a large inflated ball with the hands over a net 7 ft. 6 in. high. A team usually consists of 12 players, but from 10 to 40 may participate, depending on the size of the field. In playing, the open hand is used as a racket and the object is to keep the ball volleying back and forth over the net without coming to the floor or ground. Fifteen points constitute a game, and the first to score that number wins.

Volstead Act, an act passed by the U.S. Congress in 1919 to supplement the 18th (Prohibition) Amendment. The Volstead Act defined intoxicating beverages as those containing more than 0.5 per cent of alcohol or more by volume, and provided for the enforcement of the 18th Amendment. The act was amended in 1933 to allow the sale of beer and wine with an alcohol content of 3.2 per cent, and became void after the repeal of the Prohibition (*q.v.*) Amendment in that same year. Its author was Andrew J. Volstead (1860-1947), Congressman from Minnesota from 1903 to 1923.

Volt (*vōlt*), in electricity, the practical unit of pressure, or potential difference, so named from Alessandro Volta (*q.v.*). The volt is the electromotive force required to cause a flow of one ampere through a resistance of one ohm. See also *Electrical Units.*

Volta (*vôl'tä*), ALESSANDRO, scientist, born in Como, Italy, Feb. 18, 1745; died Mar. 5, 1827. In 1774 he became professor of philosophy at Pavia, where he taught successfully until 1804, when he resigned to devote his attention to various writings on physics. He visited Germany, France, and Holland in 1782 and was called to Paris by Napoleon in 1801, where he received a medal for his discoveries in electricity and was made a member of the French Inst. In 1815 he became director of the philosophical faculty of Padua under the patronage of the Emperor of Austria, but retired in 1819. Volta is the inventor of the electroscope, the electrophorus, and the voltaic pile. The last named is an arrangement for producing electricity by chemical action on plates of dissimilar metals, as zinc and silver, zinc and copper, or zinc and platinum. It is the original ancestor of the now-familiar electric battery.

ALESSANDRO VOLTA

Voltaic Republic (*vŏl-tā'ĭk*). See *French West Africa.*

Voltaire (*vŏl-târ'*), FRANÇOIS MARIE AROUET, writer and philosopher, born in Paris, France, Nov. 21, 1694; died there May 30, 1778. He was the son of François Arouet, a minor official. Voltaire's early education was entrusted to the Jesuits. Afterward he endeavored to begin a literary career, but his father objected and persuaded the Marquis de Châteauneuf, brother of Voltaire's sponsor, the Abbé de Châteauneuf, to take the young man to The Hague with him. After their return, Voltaire studied law for a time, but soon abandoned law for literature. In 1717 he was imprisoned in the Bastille for a short time and while there wrote "The Henriade" and finished "Oedipe," a tragedy, his first highly successful production, which was first performed in 1718. Now popular as a writer, and noted for his wit and brilliance, he became a favorite in court society of Paris, but in 1719 he was expelled from the city for a time. In 1722 he went with Madame de Rupelmonde to Holland, returning in the winter of that year to Paris. In 1726 he was imprisoned in the Bastille for having challenged the Chevalier de Rohan to fight a duel on account of an insult. He was liberated after a few weeks and again expelled from France. At the invitation of Lord Bolingbroke, he went to England. At this time he began to sign himself Voltaire, which is believed to be an anagram on *Arouet le jeune* (l.j.), *u* being equivalent to *v* and *j* to *i.*

Voltaire remained in England for three years, long enough to become acquainted with English literature and with contemporary English literary men. George I had died while he was in England and his queen, Caroline, who took great interest in literature, showed Voltaire marked favors.

There he wrote the tragedy "Brutus" (1730) and his life of Charles XII (1730), and there also he made a fortune with the publication of his poem "The Henriade."

On his return to France he published "Lettres philosophiques sur les Anglais" (1733), an attack on church and state in France, and "The Temple of Taste" (1733), a satiric criticism of almost all French writers of his day. This made him so unpopular that he was again forced to leave Paris. He took up residence in Lorraine, where he lived for many years with the Marchioness de Chatelet. There he wrote a number of tragedies, including "Mahomet" (1741), and while he was there he was admitted to the Academy (1746).

After the marchioness' death, Frederick the Great renewed his often-extended invitation to Voltaire to live at his court in Potsdam, Germany. In 1751 Voltaire accepted and remained at the Prussian court for three years, during which time he published "Le Siècle de Louis XIV" (1751) and probably began his "Dictionnaire philosophique" (1764). His early career at the court was of exceptional brilliancy, but later he became implicated in a series of disagreements and court quarrels. After he retired from the court, he took up his residence at Colmar and subsequently purchased the estate of Ferney, four miles from Geneva, where he lived for 20 years with his niece, Mme. Denis. His life at Ferney was one of notable activity in literature. There he wrote many of his fine tragedies and historical works, and the most celebrated men of Europe visited him there. He maintained an extensive correspondence with scholars and princes of Europe and wrote a number of criticisms, poems, and philosophical treatises. Always a shrewd business man, he built up a tremendous fortune.

Some time after the death of Louis XV he was permitted to return to France, and on Feb. 10, 1778, was received enthusiastically at Paris after an exile of 28 years. He completed his play "Irène" (1778) after his return and witnessed its production on the stage shortly before his death in the same year. He was buried at the abbey of Scellières in Champagne, but the church would not allow official burial; his body was removed to the Panthéon in 1791.

Voltaire's complete works, which have been published in 90 volumes, covered almost every branch of literature and are as colorful and rich as his life. Besides those works already mentioned, his writings include a history of Peter the Great, the tragedies of "Mérope" (1743) and "Zaïre" (1732), the philosophical novels "Candide" (1759) and "Zadig" (1747), and the essay "The Manners and Spirit of Nations" (1756).

As a philosopher, he popularized Newton's physics and Locke's philosophy, but even more important was his ardent fervor in fighting for freedom of speech and the printed word. He represents the best side of the Enlightenment (*q.v.*), and wrote numerous contributions to the "Encyclopédie," although D'Alembert and especially Diderot were both more important men of letters than he was. Peculiarly, he held almost Puritan views about morals and ethics, but, in contrast to the Puritans, he applied these views only reluctantly to his personal life.

VOLTAIRE

Theologically, he was a liberal Deist (see *Deism*) and fought for a kind of natural religion and against any kind of bigotry. In spite of his inner conviction of the existence of God, he fought against the church continuously, although Pope Benedict XVI accepted the dedication of his tragedy "Mahomet" (1741) and blessed Voltaire as its author.

As a historian, he is characterized by an unequal and unbalanced knowledge of facts, but he overcomes this lack by the charm of his writing and the almost novel-like form of his depiction of historical events, enriching the narrative always with the most witty epigrams.

As a novelist, he is especially known for "La pucelle" (1755) and what is perhaps his most famous work, "Candide," both of them bitter satires, splendidly narrated.

As a playwright, he cannot be compared with Corneille and Racine, although he is consciously "classical" like them, but the compass of his mind was larger than theirs although of less creative poetic imagery.

During his lifetime as well as after his death, Voltaire presented a very interesting human problem. While he lived (and hardly less today) he served as an example of a human personality who was intellectually gifted far above his human level; while he honestly fought for the greatest ideals of mankind, he was at the same time mean and egotistic, vain and greedy. Throughout his whole life his personal ethical behavior contradicted what he preached. In his pamphlets he fought equally well against recognized evils and against personal enemies. His pen and wit have to be entirely separated from his character.

His influence upon his time and upon later periods cannot be overestimated. Today it is still he who is considered *the* representative of Enlightenment, instead of Diderot, D'Alembert, or Rousseau, who certainly were more profound thinkers although not so universally gifted.

Voltmeter (*vōlt′mē-tẽr*), an instrument for measuring electromotive force. Several instruments of this kind are in general use, but the most common form is a galvanometer arranged so that volts may be read directly by means of a pointer and a scale. It has a movable coil mounted on jeweled bearings, and the coil is kept in position by fine spiral springs. In some types the movement of the pointer depends upon the movement of a piece of soft iron on a coil, while in others it is influenced by the movement of one coil with respect to the other. The difference of potential is measured in some voltmeters by the effect of heat upon a long platinum wire, the heat being due to the passage of a current. See *Galvanometer.*

Volturno (*vôl-to͞or′nō*), a river of Central Italy flowing 115 m. from the Apennines into the Tyrrhenian Sea. Capua, the head of navigation, lies on its banks. A Roman colony was founded at its mouth in 194 B.C. On Oct. 1, 1860, Garibaldi defeated the Neapolitan troops on its banks. In World War II, Allied forces crossed the Volturno River on Oct. 9, 1943.

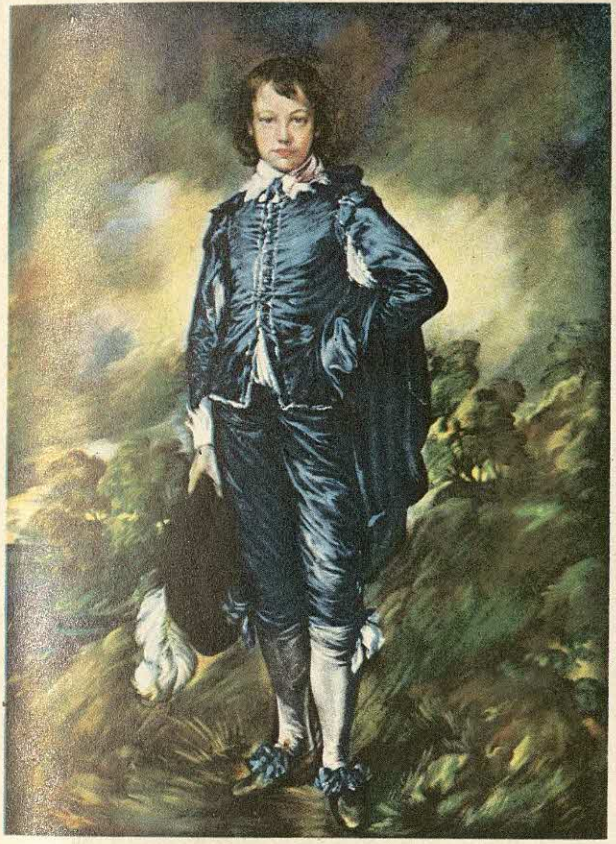
Volunteer (*vŏl-ŭn-tēr′*), a citizen who enters the military service of his own accord, or who in time of war offers his service to the country. The name volunteers is applied in most armies to those men or officers who offer to take part in an assault of particular danger, as in an attempt to capture a powerful battery or to storm a fortress. The survivors usually receive promotion or are especially rewarded. The attempts to wrest Jerusalem from the Mohammedans, known as the Crusades, included the largest number and one of the most famous instances of volunteer service in history. In 1794 and in 1803, when 400,000 men were under arms, the British volunteered in large numbers to repel a threatened French invasion of England. Another notable example is the large number of volunteers who joined the German armies to accomplish the overthrow of Napoleon in 1813-14. During the Civil War in the U.S., from 1861 to 1865, many of the 2,656,533 men in the Federal service were volunteers. Practically all the men added to the service in the U.S. at the time of the Spanish-American War were volunteers and many thousands volunteered for service in the two world wars.

Volunteers of America (*vŏl-ŭn-tērz′ of ȧ-mĕr′ĭ-kȧ*), a non-sectarian philanthropic movement, organized in the U.S. in 1896 by Ballington and Maud Booth, who later became the first commanders-in-chief of the organization, and served unitedly until Ballington Booth's death in 1940, at which time the governing council elected Mrs. Maud Ballington Booth to continue as commander-in-chief. The organization, which is essentially religious and secondarily concerned with social welfare activities, was established to extend spiritual fellowship to all nationalities, races, and creeds uncared for by other religious agencies, and to relieve distress and suffering. It has a number of departments serving men, women, and children, and in pursuit of its objects maintains mission chapels, men's and women's hospices, service clubs, camps, a hospital, maternity homes, and a nation-wide prison work within the walls of state and Federal prisons.

Vomiting (*vŏm′ĭt-ĭng*), the act of ejecting some of the contents of the stomach, through its own spasmodic contraction, by way of the mouth. It is usually preceded by a feeling of nausea, a free flow of saliva in the mouth, and frequently by a headache and free perspiration. The immediate cause is a contraction of the abdominal muscles, assisted by the active co-operation of the muscular walls of the stomach, while the diaphragm affords a firm surface against which the stomach is pressed by the abdominal muscles. An overloaded stomach, entrance of poisonous substances into that organ, and some diseases and conditions of the body are among the chief causes of vomiting. It frequently accompanies seasickness or airsickness. Those suffering with this ailment should lie down to rest. Mild stimulants, a small quantity of soda, or an external application of mustard at the pit of the stomach often furnish relief. Some animals, as the llama and the vultures, eject the contents of the stomach as a means of defense against their enemies.

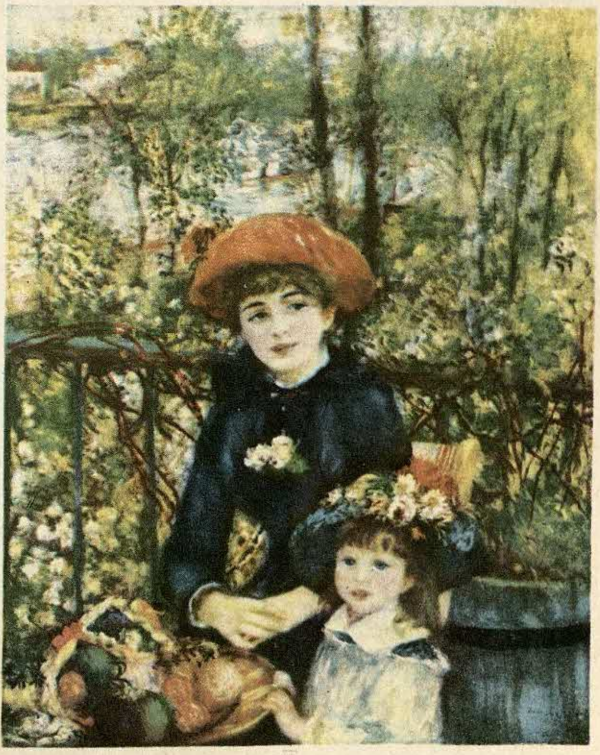
Vonnoh (*vŏn′ō*), ROBERT WILLIAM, portrait painter, born in Hartford, Conn., Sept. 17, 1858; died Dec. 28, 1933. He attended the Boston public schools and the Normal Art School in that city, and subsequently studied under Boulanger and Lefebvre, in Paris. In 1891 he returned to America. Although devoting much of his time to portrait and landscape painting, he accepted an instructor's position at the Pennsylvania Acad. of Fine Arts, remaining there until 1896. His works include: "A Poppy Field," "Little Louise," "Sad News," and "Miss Mildred Blair." His second wife, *Bessie Potter Vonnoh,* a sculptor, was born in St. Louis, Mo., Aug. 17, 1872. She studied at the Chicago Art Institute. In 1904 she was awarded the gold medal at the Louisiana Purchase Exposition, St. Louis.

Voodoo (*vo͞o′do͞o*), a secret system of magic,



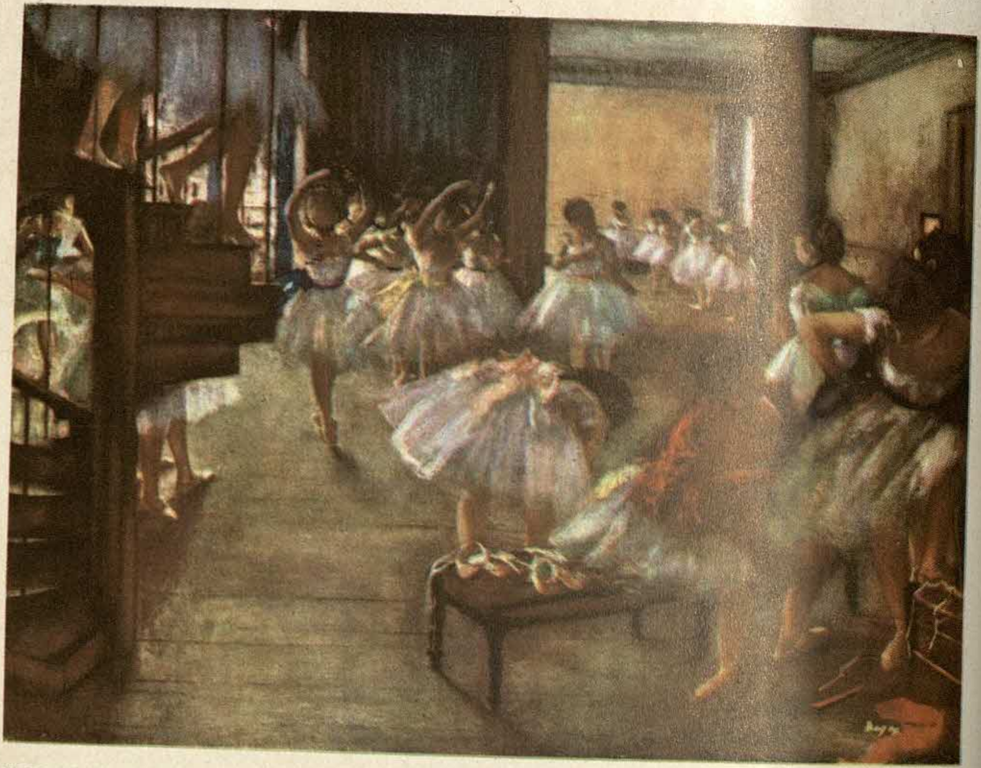
THE BLUE BOY

THOMAS GAINSBOROUGH
(English, 18th century)

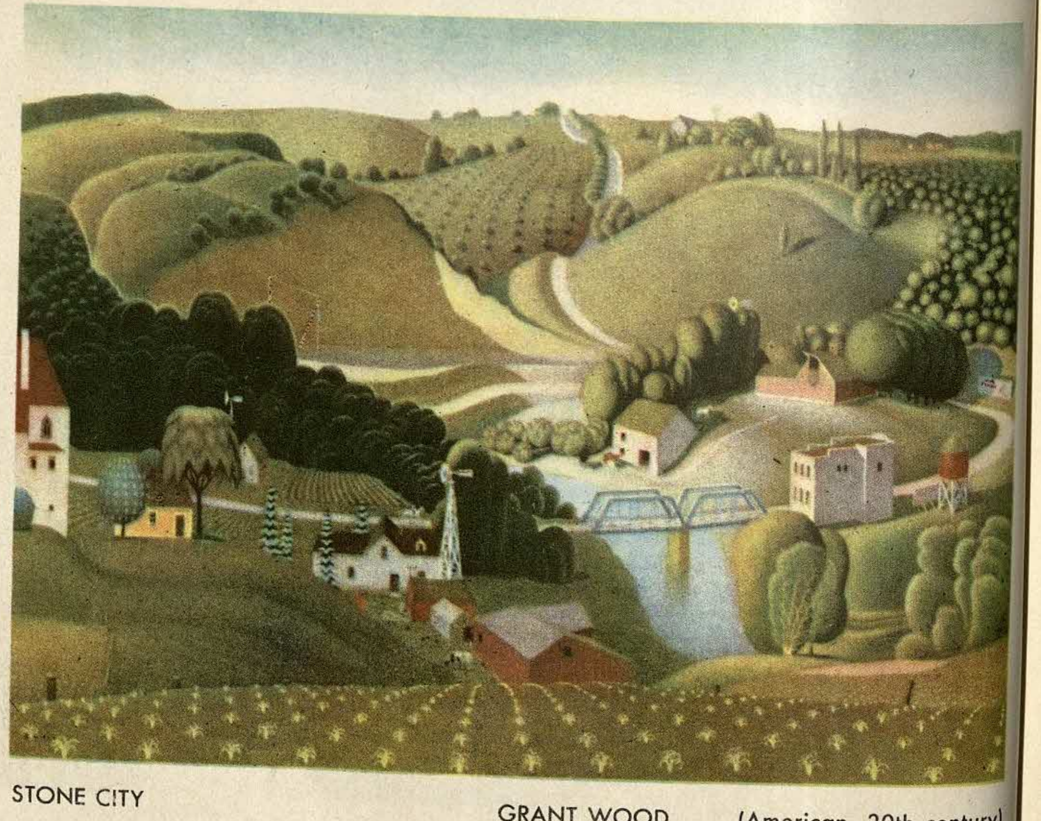


ON THE TERRACE

PIERRE AUGUSTE RENOIR
(French, 19th century)



ECOLE DE DANSE EDGAR DEGAS (French, 19th century)



STONE CITY GRANT WOOD (American, 20th century) consisting of rites, charms, conjuring, snake-worship, witchcraft, sacrifices, and other superstitious beliefs, known collectively as *voodooism.* These voodoo practices are prevalent among the West Indian natives, particularly in Haiti, and the Creoles and Negroes of the Southern U.S. The cult is based on African tribal beliefs with a mixture of other religious and magic rites. The leader of a local group is called the *voodoo doctor, priest,* or sometimes *ḳing* or *queen,* or *papa* or *mama.* Their secret rituals involving serpent-worship accompanied by ecstatic, hysterical states of emotion, weird dances, and, in rare cases, cannibalism and human sacrifice, occur at night. Their magical practices are known to have been common the world over among primitive peoples.

Vorarlberg (*fōr′ärl-bĕrḳ*), a province of western Austria, bounded on the E. by the Tyrol, on the S. by Switzerland, on the W. by the principality of Liechtenstein and by Switzerland, and on the N. by Bavaria. It has an area of *ca.* 1,000 sq. m.. The eastern part of the province is mountainous, and in the western part, near Lake Constance, the land is fertile and productive and highly suited to the cultivation of fruit and grapes. The uncultivated regions are productive forests and grazing lands, with lumber, cattle raising, and dairying the important industries. The chief manufactures are cotton textiles, wooden articles, and embroidered products. A large part of the inhabitants speak an Alemannic dialect and are Catholic. Bregenz (pop. 20,318) is the capital, and Dornbirn is the chief city.

From the 9th century up to 1160, the counts of Bregenz were the rulers of Vorarlberg; they were succeeded by the counts of Montfort. Between 1376 and 1765 the Hapsburgs acquired Feldkirch, Bludenz, Bregenz, Neuburg, and Hohenems, and Maria Theresa of Austria united these lordships under the administration of a governor in Bregenz. Administered since 1782 from Tyrol, Vorarlberg was assigned to Bavaria (1805-14) but was returned to Austria in 1815. In 1860 the Vorarlberg diet was organized. In 1918 the province tried unsuccessfully to be united with Switzerland. After World War II the province was in the French zone of occupation. Population, 1951, 193,715.

Voronezh (*vŭ-rô′nĕsh,* Russian, *vŭ-rô′nyęsh*), a city of south central U.S.S.R., capital of the Voronezh region of the R.S.F.S.R., near the Don River. The city is 170 m. N.E. of Kharkov, on the main railroad line between Moscow and Rostov, and is in the heart of a rich agricultural area which produces wheat, tobacco, cotton, barley, sugar beets, and sunflower seeds. Voronezh is a major industrial center, with manufactures of machinery, diesels, aircraft, synthetic rubber, and foodstuffs. It has a university, an agricultural institute, and schools of medicine and engineering. Voronezh was first occupied by the Russian czars in 1586. Later, under Peter I, it became a shipbuilding center and was strongly fortified. From 1928 until 1936 the city and region of Voronezh were part of the Central Black Earth Area. The city was in large part destroyed during World War II; captured by the Germans (July 1942), it was retaken by the Russians (January 1943). Population of the region, 1939, 3,551,009; of the city, 326,836.

Voronoff (*vô-rô-nôf′*), SERGE, surgeon, born in Voronezh, Russia, July 10, 1866; died in Lausanne, Switzerland, Sept. 1, 1951. Educated in Paris, France, he later became director of experimental surgery at the Collège de France. He became internationally known for his experiments in surgical grafting of animal glands to correct glandular deficiencies in humans. In 1937 he announced that the intelligence and growth of retarded children could be stimulated by grafting the thyroid glands of monkeys.

Voroshilov (*vŭ-rŭ-shĭ′lôf*), KLIMENT EFREMOVICH, soldier and Communist leader, born in the Ukraine, Russia, Feb. 4, 1881. In his youth he engaged in revolutionary activity and in 1903 joined the Bolshevik wing of the Social Democratic party. From 1907 to 1914 he was in banishment; during World War I he supported Lenin; in 1918 he organized guerrilla warfare against the Germans occupying the Ukraine. In 1921 he was made a member of the central committee of the Communist party and was appointed military commander of northern Caucasia. He was named Red Army commissar for the armed forces of the U.S.S.R. in 1925. When the Germans invaded Russia in 1941, Voroshilov was put in charge of the northwestern front, where he organized the defense of Leningrad. Later, as a member of the Soviet war cabinet, he helped to plan the early

Courtesy Sovfoto, N. Y.

K. E. VOROSHILOV

counteroffensives of the Red Army. After the war he was appointed deputy premier under Stalin; and after the latter's death in 1953 Voroshilov was named president of the Presidium of the Supreme Soviet, a title roughly equivalent to honorary president of the U.S.S.R.

Voroshilovgrad (*vô-rô-shē'lôf-gräd*), formerly LUGANSK, city in the Ukrainian Soviet Socialist Republic, capital of Voroshilovgrad oblast, on the Lugan River, *ca.* 90 m. N. of Rostov. Located in a region of extensive coal mines, it is a major industrial city producing locomotives, steel pipes, machinery, processed foods, and textiles. Founded in the 18th century, it was renamed (1935) after Kliment E. Voroshilov, Red Army marshal. It was captured by the Germans in 1941 and again in 1942, and they held it until 1943. Population, *ca.* 251,000.

Vorticella (*vôr-tĭ-sĕl'ȧ*), a genus of Infusoria found both in fresh and salt water. They are very numerous and many forms are microscopic. The head is bell-shaped and is fixed upon a stem, which is capable of being greatly extended and contracted. Around the mouth, or oral disk, are many long cilia which keep constantly in motion to draw in food. This motion causes a movement of the water at the mouth and is spoken of as the *miniature whirlpool of the vorticella.* Formerly the name was extended to a large group that live in colonies, but these have been separated from the true vorticellas.

Vosges (*vōzh*), a mountain range of Europe. Lying north of the Jura Mts., it is 20 m. to 50 m. wide, *ca.* 140 m. long, and its highest point is about 4,670 ft. The range has forests and pastures, as well as deposits of copper, lead, salt rock, silver, and coal. The Moselle, Saar, Saône, Ill, Meurthe, and Lauter rivers rise in the Vosges. West of the range is a department of France called Vosges, with an area of 2,303 sq. m. The department is industrial in character: there are breweries and distilleries; and cotton, linen, and woolen fabrics are produced. Population, 1952, 365,000.

Voss (*fôs*), JOHANN HEINRICH, scholar and author, born in Sommersdorf, Germany, Feb. 20, 1751; died in Heidelberg, March 29, 1826. He went (1772) to Göttingen to do editorial work and, although he later was rector of a school in Otterndorf, spent most of his life in literary work.

Voss's importance lies in his combination of reliable philological scholarly studies with a strong poetic gift. In his youth he belonged to the famous "Göttinger Dichterbund," a group of poets who had decisive influence upon German literature from *ca.* 1770 onward. Voss's reputation was based on his translation of Homer's "Odyssey" in the original meters. This and his later translation of the "Iliad" are still the most widespread German translations of the Homeric classics and became as much the background of German education as Schlegel-Tieck's translation of Shakespeare's works into German. With his immense knowledge of Greek mythology, Voss continued translating the greatest works of antiquity, such as Virgil's "Georgics," and wrote treatises on literature and mythology. He published one original idyl, "Luise" (1795).

Vote (*vōt*), an individual expression of choice in the making of a group decision. The decision may be the answer to a question or the selection of an officer or a group of representatives. The process of voting is called an election (*q.v.*).

Methods of voting may vary, depending partly on the object to be accomplished. The simplest kind of object is the selection of one out of two possible alternatives, *e.g.,* the vote in a meeting as to whether or not a particular motion shall be adopted. Another is the election of an officer where only two have been nominated. For this sort of decision each person qualified to vote is ordinarily given one vote, and the alternative which receives more votes is adopted.

Sometimes in voting there are special restrictions. In public legislative bodies a proposed law usually has to receive the votes of more than half of all the members; otherwise it is defeated, even if there are more votes for it than against it. In certain cases a vote of two-thirds of the members is frequently required for approval.

When one proposition or candidate is to be chosen out of three or more alternatives, special methods are often adopted to secure a majority choice, since otherwise the one chosen as having most votes might be distasteful to a majority who divided their votes among the other candidates or alternatives. For example, in a simple plurality election, candidate *A* might be elected with 40 votes over candidate *B* with 35 and candidate *C* with 25, even though all 60 who voted for *B* or *C* might consider *A* the worst of the three candidates. The most usual way of meeting this problem is to hold a primary election (*q.v.*) to eliminate one or more of the weaker candidates. Frequently, however, the primary system permits three or more candidates to remain for the final election and so does not solve the problem completely. It is possible to accomplish the purpose of a primary by preferential voting in the final election without any preliminary election. The voters are invited to express first, second, and further choices among the candidates. The votes are then counted by one of several methods designed, more or less perfectly, to secure a real majority choice.

The Hare system of majority preferential voting or "alternative vote" counts all the first choices; then if no candidate has a majority, the lowest candidate is dropped and his ballots are transferred to the second choices marked on them; if still no candidate has a majority, the candidate then lowest is dropped and his ballots are transferred to their next choices, and so on until one candidate has a majority. This in principle is a succession of primaries, one candidate being dropped after each one.

When several candidates are being elected together to a representative body it is possible to adopt voting and counting arrangements which will give all the seats to the majority or plurality, or arrangements which will divide them among the majority and minority.

The usual majority method is to give each voter as many votes as there are candidates to be elected and let those with most votes win. If there are many candidates those with most votes may have the support of only a minority as in the election of a single officer. To avoid this, the weaker candidates may be eliminated by primaries or by a system of majority preferential voting.

If it is desired to make the representatives more nearly a cross-section of the voters, various methods are used to assure some of the representation to minorities.

The "limited vote" allows each voter a smaller number of votes than the number to be elected and elects those with most votes. If seven are to be elected together, each voter may be permitted to vote for five. The largest party will then probably elect five and the second largest two.

"Cumulative voting" gives each voter as many votes as there are members to be elected, but permits him to cast more than one vote for the same candidate. In the elections of the Illinois House of Representatives, for example, three members are elected from each district and each voter has three votes. He may, however, give all of his votes to one candidate, or divide them among two, or give one vote each to three. Any party with more than a quarter of the votes can be sure of electing one of the three if it cumulates all its votes on one candidate. If the two largest parties each try to elect two candidates by having each of their voters give one-and-a-half votes apiece to two candidates, the larger party will elect two and the smaller party one. Cumulative voting is used in many corporation elections to give representation to minority stockholders.

More exact methods have been devised to give each group of like-minded voters the same share of the members elected as it has of the votes cast. Such methods are called proportional representation (*q.v.*).

Various methods are used for recording votes. In votes on motions or proposals in assemblies the "ayes" and "noes" are taken by voice vote (either in unison or in a roll call), by a show of hands, by standing, or by ballot. In most public elections the voting is by paper ballot, with voters marking their choices in pencil. In many places voting machines (*q.v.*) are used. See also *Election; Proportional Representation.*

Voting Machine (*vōt′ĭng mȧ-shēn′*), a mechanism used for automatically recording and counting votes. Devices of this kind are designed to prevent repeating and other frauds in elections; they also provide rapidity, secrecy, etc. The first experiment with a machine of this kind was made in 1892, when certain town officers were elected in New York. The following year several states passed laws permitting the use of voting machines, some at local elections and others at all elections, the adoption to be optional with local boards. It was found that the machines were not only effective in overcoming fraud but permitted easy, accurate, and rapid voting.

Many forms of voting machines have been devised and patented. In the common style of machine it is customary to have a ballot on the plan of the Australian ballot, and the voter who enters the booth may so manipulate a keyboard that the candidates for which he wishes to vote are indicated by a *cross,* or *X,* which appears to the left of the printed name. In addition there are keys for voting *yes* and *no* on amendments or special propositions submitted.

A device known as the *Standard Voting Machine* has been used in many cities of the country since the general election of 1900. It is about 4 ft. square and 10 in. deep and stands about 6 ft. above the floor, being supported by legs. A bar projects from the upper corners so as to form the support for a curtain that constitutes a booth. The lever is thrown by the voter in such a manner that the curtain closes behind him so as to isolated him from others in the same room. He may elect to vote a straight ticket, in which case he pulls a knob over the party named and directs all the pointers to indicate that ticket. On the other hand, he may vote a mixed ticket by moving the pointer back from over the name that does not suit him and, instead, indicate his preference by moving the pointer to the opposing candidate.

Vow (*vou*), in religious usage, a promise to do something morally good in which God is called upon to witness the sincerity of the person who makes the vow. Wilfully to refuse to fulfill a vow is therefore an insult to God. Vows may not be taken with regard to *any* promise. First of all, the thing must be somehow useful and morally possible according to the limitations of human nature. A vow to memorize the telephone book is foolish and therefore void. Secondly, ignorance about conditions substantially affecting the promise renders it null. A vow to marry a woman already married to a living husband unknown to the person makes the vow void. Thirdly, a vow must be about something good and better than its contradictory. A vow to give charity to the poor is better than a vow not to give charity to the poor. For that reason a vow not to give charity to the poor—for instance, because a person has been often deceived—would be void. In religious orders, the vows commonly taken are those of poverty, chastity, and obedience.

Vowel (*vou'ẹl*), or VOCAL, an articulated sound which is made with the vocal organs open. The vowels in the English alphabet are represented by the five letters *a, e, i, o, u,* and sometimes *w* and *y*. They differ from consonants in that the latter sounds are made by the vocal organs obstructed in the process of articulation, or are mere emissions of breath articulated by the lips, tongue, teeth, and palate. See *Consonants.*

Vriendt (*vrēnt*), FRANS DE. See *Floris, Frans.*

Vulcan (*vŭl'ḳạn*) or VULCANUS, in Roman legend, the god of fire, and also (as MULCIBER) the fire averter. Vulcan appears to have been important in the early days of Rome, being honored by Romulus, the founder of the city, and worshiped with Vesta, goddess of the hearth. Later, Roman writers identified Vulcan with stories of Hephaestus (*q.v.*), Greek god of fire and handicrafts. Thus, Juno came to be identified as Vulcan's mother and Venus as his wife. The Vulcanalia, his special festival, was celebrated on Aug. 23; the ceremonies included the offering of sacrifices to the god in the hope of placating him and thus averting destructive fires.

Vulgate (*vŭl'gāt*), the Roman Catholic Church's accepted standard version of the Bible, as translated into the Latin language by St. Jerome (340?-420), and officially published by the Holy See. It is so called because of the *Motu Proprio* (a papal document using the phrase "of his own account") of Clement VIII (1536-1605) authorizing the publication of the *"editio vulgata"* or "vulgate edition." Pope Damasus I gave St. Jerome the task of purifying and correcting the so-called *"Itala,"* an older Latin text of the New Testament, which had been translated from Greek manuscripts. This St. Jerome did and then began to translate the Old Testament anew from the original text. In 405 the whole work was finished, but the old *"Itala"* version of the Psalms was retained with minor corrections by St. Jerome. Although there is no doubt that certain changes and misinterpretations crept into the original work of St. Jerome during the Middle Ages, the Council of Trent (*q.v.*) nevertheless recognized the Vulgate as authentic in matters of faith and morals. In 1462, it was printed for the first time in Mayence. Pope Sixtus V revised the Vulgate in 1588 and issued a special bull to stabilize his revision as the authentic Bible. Two years later, however, his successor, Gregory XIV, recalled it and re-edited it. In 1592, his successor, Clement VIII, revised it again and this last revision is now the authentic version. In 1609, it was translated into English by refugee English priests at Douai, Belgium, and this translation is, therefore, called the Douay version. Pope Pius X commissioned the Benedictines to make a revision of the Vulgate in 1908, but this version has not been completed. The Holy See recently permitted translations to be made from the original Greek and Hebrew.

Vulpius (*fo͞ol'pĭ-o͞os*), CHRISTIAN AUGUST, author, born in Weimar, Germany, Jan. 23, 1762; died there June 26, 1827. After receiving instruction from private tutors, he studied at the Univs. of Jena and Erlangen, where he specialized in Latin and modern literature. In 1797, he was appointed secretary of the court theater at Weimar, which was at that time under the direction of Goethe. While there he published many operas, dramas, and historical works based on ancient literature. His chief work is "Rinaldo Rinaldini," a romance. His sister, CHRISTIANE VULPIUS (1765-1816), in 1806 became the wife of Goethe (*q.v.*), who made her the heroine of his "Venetian and Roman Elegies."

Vulture (*vŭl'tûr*), any one of a class of birds of prey, distinguished by a bare head and the habit of feeding on carrion. These birds are confined largely to the warmer climates, where they are useful as scavengers to consume the carcasses of animals. In all species the neck is strong, the head is quite level on the top, and the flight is elevated. The large feet and strong legs enable them to walk with comparative ease. The head and neck are destitute of feathers, the beak is elongated, and the upper mandible is considerably curved at the end. They differ from most birds of prey in that the female is smaller than the male; and they differ from the eagles in that they do not carry the food to the young, but swallow the carrion and feed the nestlings from their crops. Vultures have an extraordinary development of the senses of sight and smell.

The *turḳey buzzard,* a species of vulture widely distributed in the warmer parts of America, is a gregarious bird and collects in flocks, both while flying and while feeding. The body is over 2 ft. long, the color is brownish black, and the extended wings measure about 6 ft. from tip to tip. An allied species known as the *carrion crow* is abundant in Central and South America. The *California vulture,* found only west of the Rocky Mts., is the largest bird of prey in North America. Its general color is shining black above, with bands of white on the wings, which measure about 10 ft. when extended. The head and bare neck are orange-yellow and red. Species native to Eurasia and Africa include the *griffon, Egyptian,* and the *cinereous* vultures. The *lammergeier* of Europe and the great *condor* of South America are noted species.

Vulva (*vŭl'vȧ*), in anatomy, the female external sexual organs.

W

W (*dŭb′'l-û*), the 23rd letter of the English alphabet. It is formed of two V's and has the value of double u. Its use dates from the time when *u* and *v* had not been formed into two separate elementary sounds, one into a vowel and the other into a consonant. The name is *double u* and its oldest form was *uu*, as in *uulfheard*. When used at the end of a word or syllable, it is either silent, as in *row* and *low*, or has the power of a vowel and modifies the preceding vowel, as in *now* and *curlew*. It is silent when initial and followed by *r*, as in *wrong* and *write*. In chemistry, it is the symbol for *tungsten*, from the German *Wolframium*.

Wabash (*wạ'băsh*), county seat of Wabash County, Indiana, on the Wabash River, 42 m. s.w. of Ft. Wayne. It is on the Wabash and the Cleveland, Cincinnati, Chicago & St. Louis R.R.'s. The city's manufactures include flour, furniture, paperboard and asbestos products, display cases, and packed meats. The surrounding country is agricultural and has natural gas deposits. The Paradise Springs Treaty with the Indians, opening the area to white settlement, was signed here in 1826, and Wabash was settled *ca.* 1835. It was incorporated in 1866. Population, 1950, 10,621.

Wabash, a river of the U.S., which rises in Western Ohio and after a general course toward the southwest, joins the Ohio. In its lower course it forms the boundary between Indiana and Illinois. It is navigable about 300 m. Among the chief tributaries are the Tippecanoe, Embarras, Little Wabash, and White Rivers. The total length is 550 m. It is connected with Lake Erie by the Wabash & Erie Canal. The cities on its banks include Covington, Peru, Lafayette, Wabash, Logansport, Vincennes, and Terre Haute.

WAC (*wăḳ*). See *Women's Army Corps.*

Wacht am Rhein (*väḳt′ äm rīn′*), DIE, a German patriotic song, known in English as *The Watch on the Rhine*. The words were written by Max Schneckenburger and the music was composed by Karl Wilhelm. In 1840, when a French army threatened the left bank of the Rhine, the song was written and immediately became popular.

Waco (*wā'ḳō*), county seat of McLennan County, Texas, 95 m. N.E. of Austin, on the Missouri-Kansas-Texas, the St. Louis Southwestern, the Missouri Pacific, the Southern Pacific, and the Texas Electric R.R.'s. It is situated in a fertile valley at the junction of the Brazos and Bosque Rivers. Manufactures include tires, glass containers, concrete pipe, cement, cotton goods, clothing, mattresses, sporting goods, milk products, furniture, iron and steel products, hats, tents and awnings, and cottonseed oil. It is surrounded by an agricultural region producing dairy products, cotton, grain, livestock, and fruits. The principal places of interest are Baylor Univ. (the oldest institution of higher learning in Texas), Cameron Park, and Paul Quinn Coll. for Negroes. The town was settled in 1849 and incorporated in 1850. Population, 1940, 55,982; in 1950, 84,706.

Wadai (*wä-dī′*), a native state of North Central Africa, situated in the Sudan. It is bounded on the N. by the Sahara, E. by Darfur, S. by French Congo, and W. by Bagirmi and Lake Tchad. The area is about 170,000 sq. m. Much of the surface is broken and thickly forested. The region has a general elevation of 2,000 ft., but the Guere Mts. in the southwest have a height of 3,000 ft. Rainfall is slight and the water courses dry up during the summer. The soil is fertile, but the northern section is too dry for general farming despite the abundance of fine grasses.

Cattle, camels, and horses are raised in large numbers. Rice and wheat are the leading cereals. Other products include ostrich feathers, ivory, timber, maize, and fruits.

The population consists chiefly of Negroes and Arabs. Mohammedanism is the principal religion. Wadai was founded as a kingdom in 1625, but paid tribute to Bornu and Darfur for many years. Sultan Ali conquered it about 1860, when European explorers began to visit the section. In 1899 the region was placed in the French sphere of influence. Abeshr is the capital and is on several extensive caravan routes. During World War II, Wadai supplied the Free French with troops, who fought under Gen. Le Clerc. Population, *ca.* 2,000,000.

Wade (*wād*), BENJAMIN FRANKLIN, U.S. Senator, born in Springfield, Mass., Oct. 27, 1800; died in Jefferson, O., Mar. 2, 1878. He moved with his father to Ashtabula County, Ohio, in 1821, and spent some time as a wood chopper and cattle drover. He studied law and, after being admitted to the bar in 1827, began a successful practice at Jefferson, county seat of Ashtabula County. He was elected county attorney in 1835 and in 1837 became a member of the state senate, serving with one intermission until 1843. In 1847 he became a district judge in Ohio, and in 1851 was elected to the U.S. Senate, where he served continuously until 1869. Wade was an able opponent of slavery. He served as chairman of the committee on the conduct of the war, and opposed every proposed compromise between the North and the South that did not provide for the abolition of slavery. After the war he opposed the reconstruction policy of Andrew Johnson. After the death of President Lincoln, he was chosen president *pro tem.* of the Senate. In 1871 he served on the San Domingo Commission.

Wadsworth (*wŏdz'wûrth*), JAMES SAMUEL, soldier, born in Geneseo, N.Y., Oct. 30, 1807; died May 8, 1864. He studied at Yale and Harvard, and afterward read law in the office of Daniel Webster. After being admitted to the bar, in 1833, he supervised landed interests in Western New York, which he had inherited from his father, and gave much attention to the promotion of education. He served as a member of the Peace Commission in Washington, D.C., in 1861. At the beginning of the Civil War he enlisted in the Union service and attained to the rank of brigadier general. His services were particularly distinguished at Fredericksburg, Gettysburg, and Chancellorsville. When Grant became commander of the Army of the Potomac, Wadsworth was asisgned a division of that army. He was fatally wounded in the Battle of the Wilderness on May 6, 1864, and died two days after.

Wadsworth, JAMES WOLCOTT, legislator, born at Geneseo, N.Y., in 1877. The son of James W. Wadsworth, who conducted an extensive farming and livestock business, he was graduated from Yale Univ. in 1898. Enlisting in the army during the Spanish-American War, he served as a private in the Pennsylvania Light Artillery. After being discharged he traveled to various parts of the world, then returned to take charge of his father's business. He was the manager of a large ranch at Paloduro, Tex., from 1911-15. His political career began in 1905 when he was elected as a Republican New York state assemblyman from Livingston County. From 1906-10 he acted as speaker of the assembly. He served two consecutive terms in the U.S. Senate, from 1915-27. He became a member of the U.S. House of Representatives in 1933, and was re-elected in each successive election. He was a co-sponsor of the original Selective Service Act of 1940. He was a trustee of the Carnegie Institution of Washington. His wife, Alice Hay Wadsworth (1880-), to whom he was married in 1902, was for many years a civic leader and active member of women's groups. He died on June 21, 1952.

Wafd Party (*wŏft pär'tĭ*), an Egyptian nationalist party which came to prominence following the close of World War I when popular sentiment in Egypt demanded representation at the peace conferences. The Wafd program called for democratic equality and liberation from foreign influence and control in Egypt; it has become the country's leading party.

Wage and Hour Law (*wāj and our lạ*). See *Fair Labor Standards Act.*

Wager (*wā'jẽr*), a contract based upon the determination or ascertainment of an uncertain event, under which one of the parties is to make a payment or transfer a valuable consideration to the other. Usually the consideration is placed as a trust in the hands of a third party, who is to deliver it to the one entitled to receive it after the points of uncertainty have been determined. Formerly a wager was valid under the common law, unless it was of a condition that rendered it immoral or opposed to public policy. Now wagers are looked upon in most countries as debts of honor and their payments depend upon the good faith of the parties to the agreement, since they are held to be without a valuable consideration.

Wages (*wā'jẹz*), the payment for services rendered, especially the payment of manual laborers receiving a fixed sum for a specified interval of time, as per day, week, or month. Writers generally classify wages as *nominal* and *real*. The former indicates the amount of money received for a certain quantity of labor, while the latter has reference to the quantity of commodities which the money received for the labor will purchase. In the case of a man receiving $2 a day in 1920 and $3 for the same work in 1926, it does not necessarily follow that the wages in the latter case were 50 per cent higher than in the former, though it might or might not be true. It certainly would not be true if the purchasing power of money were twice as great in 1932 as in 1926. Other conditions modifying wages include the demand for and supply of laborers, the skill of those offering to do work, and the agreeableness of the employment. The State of Victoria, Australia, as early as 1896, created laws under which was fixed the least wage which employers in certain trades might pay. Similar laws, known as *minimum wage laws,* are now in force in Great Britain and the U.S. See *Fair Labor Standards Act.*

It is common to estimate wages as high or low according to the amount of money received for the time employed, but economists more correctly base the estimate of wages on the results achieved. Thus a $2 ax may be cheaper than a $1 ax, especially if the work done with it is three times as great as that accomplished by the cheaper one. In the same way, the laborer receiving the highest pay may, by reason of his superior skill, be the cheaper one for the employer. It is certainly in line with good economy to obtain that class of labor which produces the most at the least expense, rather than to obtain the kind that can be had at the lowest price. An effort to fix wages by law was first made in England in the reign of Edward III. See also *Labor; Overtime; Political Science; Rent; Socialism.*

Wagner (*väg′nẽr*), COSIMA, music patroness, widow of Richard Wagner (*q.v.*), born at Bellagio on Lake Como, Italy, Dec. 25, 1837; died at Bayreuth, Germany, Apr. 1, 1930. Brought up in a world of music, she first married the composer, Hans von Bülow (1830-94), a former pupil of her father, Franz Liszt (*q.v.*). Divorcing him in 1869, she was married to Wagner a year later. In Bayreuth, Germany, where they moved in 1872, she was influential in establishing the renowned annual music festival, of which she was art director until 1908; during her lifetime she remained the guiding light in the development of Bayreuth's musical season and in the preservation of Wagner's ideals.

Courtesy Brown Bros., N. Y.

COSIMA WAGNER

Wagner (*wăg′nẽr*), ROBERT FERDINAND, U.S. Senator, born in Nastatten, Germany, June 8, 1877; died in New York City, May 4, 1953. Brought to the U.S. as a child, he was educated in New York City. A graduate of City Coll. and of New York Law School, Wagner practiced law in New York City. He served (1905-8) in the state assembly and in the state senate (1909-18). When public opinion was aroused after many workers had perished in a factory fire, he was made chairman of the senate's factory investigating commission (1911). The laws passed as a result of this commission's findings have since become the models for laws in many other states. From 1919-26 Wagner served as justice of the supreme court of New York and in 1927 was elected to the U.S. Senate. In 1933, President F.D. Roosevelt appointed him chairman of the National Labor Board, which seeks to maintain industrial peace, and as chairman Wagner shaped a powerful organization of industrial courts.

Chase-Statler Photo, Wash., D. C.

ROBERT F. WAGNER

A member of the Democratic party, Sen. Wagner was the author of much of the labor and social security legislation which were the backbone of the New Deal program. He introduced in the U.S. Senate the National Industrial Recovery Act, the National Labor Relations Act (popularly known as the Wagner Act), the Railway Retirement Act, the Social Security Act, and other bills. In 1943, he advocated a broad insurance plan, the Wagner-Murray-Dingell Bill, which would provide social security (*q.v.*) "from the cradle to the grave." A strong supporter of progressive labor legislation, he opposed passage of the Taft-Hartley Labor-Management Relations Act (1947). After a long illness, Wagner resigned his senatorial post in 1949 because of his health.

Wagner (*väg′nẽr*), SIEGFRIED, composer and conductor, son of Richard and Cosima Wagner, born near Lucerne, Switzerland, June 6, 1869; died in Bayreuth, Germany, Aug. 4, 1930. He abandoned his father's wish that he study architecture, studying music instead and learning conducting under Kniese and Humperdinck. In 1893 he began a European tour as an orchestral conductor, attracting much attention as an interpreter of Wagnerian music. He also worked with his mother in the direction of the Wagnerian Festival Playhouse at Bayreuth, later assuming entire management of the annual festival and of the playhouse. In addition, he composed several operas, symphonic poems, etc. In 1922 he published his memoirs, rich in musical history and associations.

Wagner, (WILHELM) RICHARD, composer and author, born in Leipzig, Germany, May 22, 1813; died in Venice, Italy, Feb. 13, 1883. His legal father died six months after Wagner was born, and his mother remarried. Her second husband, Ludwig Geyer, was an actor, playwright, and portrait painter. The influence of this stepfather may have caused his approach to drama-leading-into-music, rather than the reverse process common to most operatic composers. In Dresden, where he went to school, he wrote a dramatic tragedy at 14. He also dallied with music, but had little success because he hated practicing. However, he did find enjoyment in playing opera scores, notably Weber's *"Der Freischütz,"* which undoubtedly influenced him.

Wagner undertook his first serious musical studies at Leipzig, where he attended the university in 1827. Four years later he began the study of composition under Theodor Weinling. While visiting his brother Albert (a singer and stage director in Würzburg), at 20 he became an orchestra conductor, and in the next three years he composed two operas, *"Die Feen"* and *"Das Liebesverbot."* Neither of these showed any promise of his tremendous latent genius. In 1836, while serving as conductor of an orchestra in Königsberg, he married Minna Planer, an actress—first of the three loves which were to make his emotional life almost as famous as his opera career. Three years in Riga as a conductor were followed by moves to London, Boulogne, and finally to Paris where his compatriot, Meyerbeer, was the sensation of the operatic world. He had the opportunity of meeting Meyerbeer, Liszt, and Berlioz, but financial difficulties kept him from concentrating on the operas he had hoped to compose. He earned a living by writing articles and by making arrangements for other composers, which left him little time of his own. By 1840, however, he had managed to complete "Rienzi," an opera in the manner of Meyerbeer, but with a suggestion of musical revolution in the close integration of its thematic developments. This opera was not produced until 1842, in Dresden, where it was followed by *"Der Fliegende Holländer"* ("The Flying Dutchman") in 1843. Although not highly successful, this latter was the first of Wagner's operas to foreshadow his greatness. By writing his own libretto, as he was to do in all his later works, Wagner achieved an extraordinary unity of words and music, and a thrilling symphonic continuity. The story, based on the legend of the Flying Dutchman, was combined with the theme of redemption through love, presaging that preoccupation with myth and fable, love and mysticism, so characteristic of the later "Wagnerian operas."

The production of these two music-dramas in Dresden marked a turning point in Wagner's life. Shortly afterward (1843) he was appointed *kapellmeister* for life at the Dresden court, a position which would have ended his financial troubles if he had not become involved in politics. Accused of revolutionary activities in 1849, he was forced to flee from Saxony. With a passport procured for him by Franz Liszt, he escaped to Weimar, where he visited for a time at Liszt's home before moving to the safety of Zürich, Switzerland. During his six years in Dresden, Wagner had finished his opera "Tannhäuser," taken from Hoffmann's *"Der Sängerkrieg,"* and produced in 1845, and also "Lohengrin" (1848), and the poem *"Siegfried's Tod."* "Lohengrin," based upon the medieval theme of the Holy Grail, had its premiere at Weimar in 1850 under the directorship of Liszt, and became one of the most popular of Wagner's operas.

Wagner's 10 years in Zürich were filled with creative activity. He turned out theatrical and aesthetic writings such as "Art and Revolution," "The Art Work of the Future," "Opera and Drama," etc., which would one day be included in the nine volumes of his collected prose works. He also completed the entire script for the four dramas which were later set to music and grouped under the heading *"Der Ring des Nibelungen."* In these operas Wagner wove together stories from the ancient German *"Nibelungenlied"* and the Norse "Volsunga Saga," to create the great trilogy made up of *"Die Walküre"* (1856), "Siegfried" (1871), and *"Götterdämmerung"* (1874), together with *"Das Rheingold,"* written in 1854 as a prologue to the trilogy. In Zürich, Wagner found a new love in the person of Mathilde Wesendonck, a poet and wife of the friend whose villa provided a home for the composer and his wife Minna in Switzerland. Wagner composed the music for a group of Mathilde's songs, and she undoubtedly served as inspiration for the ecstasy and lyric beauty of *"Tristan und Isolde"* (1859). It was this opera which marked the composer's liberation from traditional opera forms and laid the foundation for his later popular acclaim. The score welded verse and action into a dramatic and moving whole, so powerful that it founded a new school of musical thought, even before the later style called "Wagnerian" had begun to split the musical world into pro-Wagner and anti-Wagner camps.

By 1861, Wagner had divorced Minna, visited Vienna and Paris, and received an amnesty from Germany which left him free to return. Once more, however, monetary troubles beset him, and he was rescued only by timely assistance from King Ludwig II of Bavaria (1864). Ludwig promised fulfillment of the composer's lifetime dream —a great art center, and a national theater which would insure a background and a presentation suited to the heroic scale of Wagner's operas. Meanwhile, in Munich under Ludwig's patronage, he saw the premiere of *"Tristan und Isolde"* (1865), finished "Siegfried" (1869), and worked on the score of *"Götterdämmerung."* Here, also, he found his last and greatest love. Cosima—daughter of his friend Franz Liszt and wife of another friend, Hans von Bülow—became the mother of his daughter Isolde in 1865 and of his son Siegfried in 1869. The following year (1870) Cosima divorced her conductor-pianist husband to become Wagner's wife.

During the Munich period, *"Die Meistersinger"* (finished in 1862) had its successful premiere in Munich, with Von Bülow conducting. This opera, taken (like "Tannhäuser") from Hoffmann's *"Der Sängerkrieg,"* has often been described as Wagner's only "comic opera," but it is much more than that. True, it is the only one which makes use of comedy; it is the only one not concerned with lofty myths and symbols, or with love in its more frenzied aspects; but it is also in many ways the most mature and the most finely poetic. It combines the melodic beauty of the earlier operas with the *leitmotiv* technique and the characteristic musical idiom which underlie the development of modern music. Its warm feeling for 16th-century Europe, combined with the author's understanding of man's creative spirit, and the genius he displays for dramatic character building, have made this opera a worldwide favorite.

RICHARD WAGNER
Painting by Franz von Lenbach (1836-1904)

In 1872, on his 59th birthday, his vision of a great musical center became a reality. On that day the cornerstone was laid for the *Festspielhaus* which was to make Bayreuth a Mecca for musical pilgrimage. The new theater was opened in 1876 by a complete performance of *"Der Ring des Nibelungen,"* attended by music lovers and important personages from all parts of the world. Wagner thereafter made his home in Bayreuth, not only producing operas, but also adding to the prose writings in which he defended his theories. "Parsifal," his last opera, was first produced there in 1882. Not long after this premiere, suffering from heart disease, he went to Venice to spend the winter; but he died there, suddenly, of a heart attack some five months later.

Aside from Wagner's majestic stature as a musician, he is in a class by himself in the versatility of his genius and the scope of his energies. Apostle of what he called the "art work of the future," he refused allegiance to set forms or musical conventions, merging in himself the functions of composer, poet-librettist, producer, and on occasion stage manager, director, or conductor as well. To him the music-drama must be a closely knit whole resulting from perfect balance and integration of music, words, and action. Dramatic fitness was his first essential. Master of orchestration, he knew how to give expression to his ideas through his musical score, with a power, originality, and vitality which must be granted even by those who bitterly dislike his music and disagree entirely with his theories of art. The extent to which Wagner's works still live (and cause controversy) furnishes a convincing tribute to the unique and magnificent genius of the man and to his overwhelming importance in the history and development of music.

Wagner Act (*wăg'nēr ăk̤t*). See *National Labor Relations Act; Wagner, Robert Ferdinand.*

Wagner von Jauregg (*väg'nēr fôn yow'-rĕk̤*) or WAGNER-JAUREGG, JULIUS, psychiatrist and neurologist, born in Wels, Austria, March 7, 1857; died in Vienna, Sept. 27, 1940. He was a professor and did research at both the Univ. of Graz and the Univ. of Vienna. For his discovery (1917) of the therapeutic value of malaria inoculation in the treatment of dementia paralytica, he was awarded the 1927 Nobel Prize in physiology and medicine. He also developed the use of potassium iodide in salt to decrease the incidence of goiter (*q.v.*).

Wagon (*wăg'ŭn*), a four-wheeled vehicle used for carrying freight or merchandise. A farm wagon has four wheels, usually with heavy iron tires, a rectangular box to carry the load, and shafts or a tongue for horses. A *dray* is a type of low, heavy wagon, often without permanent sides. For heavy hauling, wagons have been largely supplanted by trucks.

Wagram (*vä'gräm*), a village in Austria, *ca.* 10 m. N.E. of Vienna, in the Marchfeld, a plain between the Danube and Morava rivers. It was the site of a battle (1809) between the French under Napoleon I and the Austrians under Archduke Charles. Napoleon crossed the Danube, July 5, with *ca.* 150,000 infantry and 30,000 cavalry; he surprised the Austrians but was repulsed. In a second attack (July 6), the Austrians were defeated, losing *ca.* 26,000 of their *ca.* 129,000 men. After an armistice (July 11), the treaty of Schönbrunn, or peace of Vienna (Oct. 14, 1809), ended the campaign.

Wagtail (*wăg'tāl*), a small songbird, of the family Moticillidae, found in Europe. It received its name from its habit of flicking its tail as it walks or runs. It has a slender body and long, thin legs. It nests in stony places or among dense herbage, near lakes, rivers, or swamps, and feeds chiefly on insects and worms. The name wagtail is also given to several species of North American warblers.

Wahabis (*wä-hä'bēz*), a sect of Mohammedans founded about 1750 by Abdel-Wahháb (1691-1787), an Arabian reformer. The main tenets of this sect are orthodox and agree with the doctrine of Mohammed, but the purpose is to restore Islam to the simplicity and austerity of its founder. In practice and modes of life, these people have been called the Puritans of Islam. Their religious tenets prohibit smoking, drinking alcoholic beverages, or even using coffee. The majority of the members of the sect live in Saudi Arabia. Their number is estimated at about 3,500,000.

Wahiawa (*wä'hē̂-ạ-wä*), a city on Oahu Island, in Honolulu County, Hawaii. A residential community, it is located about 16 m. N.W. of Honolulu. Schofield Barracks, a U.S. Army post, lies adjacent to Wahiawa. Sugar and pineapple are grown nearby. Population, 1950, 8,369.

Wahpeton (*wạ'pẹ-tŭn*), a city in North Dakota, seat of Richland County, 45 m. S. of Fargo. It is situated at the junction of the two rivers that form the Red River of the North and is on the Great Northern, the Northern Pacific, and the Chicago, Milwaukee, St. Paul & Pacific R.R.'s. The surrounding country is a rich farming district. The chief buildings include a Federal Indian school and the State School of Science. Population, 1940, 3,747; in 1950, 5,125.

Wailing Wall (*wāl'ĭng wôl*), an ancient wall in the city of Jerusalem where Jews gather to lament the fall of Israel. The wall, built of stone blocks, is 59 ft. high and is supposed to contain some of the stones from Solomon's temple. See also *Holy Land; Jerusalem; Palestine.*

Wainwright (*wān'rīt*), JONATHAN MAYHEW, army officer, born in Walla Walla, Wash., Aug. 23, 1883; died in San Antonio, Texas, Sept. 2, 1953. A graduate of the U.S. Military Acad., he was a brigadier general when he was sent to the Philippine Islands, where he commanded the Philippine Division (1940). After the Japanese attack on Pearl Harbor and the bitter Bataan (*qq.v.*) campaign, he succeeded Gen. Douglas A. MacArthur (*q.v.*) in 1942 and was forced to surrender to the Japanese. He was their prisoner throughout World War II. Wainwright became commander of the 4th Army in 1946 and retired in 1947 with the rank of general. In 1948 he became president of the Disabled American Veterans.

Waipahu (*wī-pä'ho͞o*), a city on Oahu Island, in Honolulu County, Hawaii. It is located in the southern part of the island, near Pearl Harbor (*q.v.*) and west of Pearl City. In the vicinity, there are sugar plantations and plants for converting sugar cane into raw sugar. During the Japanese surprise attack on Pearl Harbor (Dec. 7, 1941), the city suffered heavy damage. Population, 1950, 7,169.

Waite (*wāt*), MORRISON REMICK, jurist, born in Lyme, Conn., Nov. 29, 1816; died in Washington, D.C., March 23, 1888. He was the son of Henry M. Waite (1787-1869), an eminent jurist. Graduated from Yale (1837), he was admitted to the Ohio bar in 1839 and elected to the Ohio state legislature in 1849. Waite, U.S. counsel in the *Alabama* claims (*q.v.*) case in Geneva (1871), became Chief Justice of the Supreme Court in 1874.

Wake (*wāk̤*), a term frequently used in place of vigil. It is the name of a festival or anniversary celebration that was formerly universal in Eng-

Official U. S. Army Photo

JONATHAN WAINWRIGHT

land. As a festival it was held on the birthday of the saint of a parish church, which was preceded by a night vigil, but the custom finally degenerated into fairs and exhibits. Edward I forbade holding wakes in country churchyards and Henry VI prohibited the sale of all articles at the festivals, except those used as food and refreshments. It is still customary in many countries for the friends and neighbors of a deceased person to hold a wake or vigil before the burial. The custom is thought to have originated from a superstitious fear that the dead body might be carried off by agents of the invisible world.

Wakefield (*wāk′fēld*), a town in Middlesex County, Massachusetts, 10 m. N. of Boston, on the Boston & Maine R.R. Among the points of interest are the Beebe Memorial Library, Hartshorne House, and nearby Lake Quannapowitt. Wakefield manufactures shoes, furniture, tents, knit goods, and ironware. It was settled about 1639, was incorporated as South Reading in 1812, and was chartered under its present name in 1868. Population, 1940, 16,223; in 1950, 19,633.

Wake Island (*wāk ī′lạnd*), a small coral atoll in the Pacific, discovered by the British in 1796, but first explored by U.S. navigators in 1841 and claimed by the U.S. in 1899. It is 3,346 m. N.E. of Sydney, Australia, and 1,740 m. S.E. of Yokohoma, Japan. Since the island is non-productive, it was uninhabited until trans-Pacific airline bases were established there in 1935 and military outposts were established in 1936. These forces were not sufficient, however, to resist the Japanese surprise attack which struck the island after the blow at Pearl Harbor (Dec. 7, 1941). For about two weeks a small detachment of U.S. Marines defended the island, but the Japanese effected a landing (Dec. 22) and held the island until 1945.

Wake-Robin (*wāk′-rōb-ĭn*), the name of several species of trillium, which is a genus of low, smooth herbs of the lily family. The root-stock is short, the stem is stout, and at the summit of the latter is a whorl of three large net-veined leaves. The solitary flower has three green sepals and three colored petals and is succeeded by a red or purple berry. Several species are widely distributed from Canada to the Gulf of Mexico. *Jack-in-the-pulpit* is a common name applied to several species of this plant, while others are known as *Indian shamrock* and *three-leaved nightshade*. This genus of plants includes the *calla lily*.

Waksman (*wäks′mạn*), SELMAN ABRAHAM, microbiologist and discoverer of streptomycin, born in Priluka, Russia, July 22, 1888. He arrived in the U.S. in 1910 (naturalized, 1916) and was educated at Rutgers Univ. and the Univ. of California. He was appointed associate professor (1925) and professor (1930) of soil microbiology at Rutgers Univ. and was marine bacteriologist (1930-42) at the Woods Hole (Mass.) Oceanographic Inst. He and his staff at Rutgers (including Dr. Albert Schatz, then a student) discovered (1943) streptomycin (*q.v.*) and, later, neomycin, actinomycin, and other antibiotics. Schatz won (1950) an out-of-court settlement granting him a share of royalties for the use of the drug. A large part of the royalties was devoted to the establishment of the Inst. of Microbiology at Rutgers, which Waksman directed until he retired in 1958. Waksman was awarded the 1952 Nobel Prize in physiology and medicine. His books include "Soil Microbiology" (1952), and "My Life with the Microbes" (1954).

Walcheren (*väl′kẹr-ẹn*), an island in the southwest part of The Netherlands, in the province of Zeeland, near the Scheldt estuary. It is quadrangular in form, with an area of about 81 sq. m., and is served by various canals, railroads, and tramways. The terrain is very low, and is protected from flood by immense dams and natural dunes. Agriculture and livestock are the island's principal industries. Middleburg, capital of the province, and Vlissingen, with a large shipbuilding industry, machine shops, and passenger traffic with England, are the most important municipalities. Vere, a picturesque town, was the favorite residence of the writer Hendrik Willem van Loon. In the 9th century Walcheren was ruled by a Frankish count named Eggihardus. It later became the common property of the counts of Holland and Flanders, and was permanently annexed by the county of Holland, with the province of Zeeland, in 1323. It played an important role in the Eighty Years' War for Independence. Vlissingen was the second town to take sides with Prince William of Orange in 1572. A British fleet occupied the island in an unsuccessful attempt to capture Antwerp in 1809. During World War II, Walcheren was one of the last Dutch strongholds to fall to the Germans (May 1940); and in November 1944, British commandos occupied the island, last German defense barring the Allies from Antwerp. Population, *ca.* 53,000.

Wald (*wa̤ld*), LILLIAN D., social worker, born in Ohio, in 1867; died in 1940. Her complete absorption in public welfare and her tireless efforts to better conditions made her one of America's outstanding social workers. In 1893 she became founder and head of the now famous Henry Street Settlement in New York City (often referred to as the Public Nurses' Settlement); her experiences in this establishment, which marked a new phase in urban social aid, are recorded in her books "The House on Henry Street" (1915) and "Windows on Henry Street" (1934). Active as well in other branches of social welfare and recipient of the gold medal award of the National Institute of Social Sciences, Miss Wald was also a strong advocate of the Federal Children's Bureau (established by U.S. Congress, 1908) and of small community and rural nursing services.

Waldeck-Rousseau (*vȧl-dĕḳ′-rōō-sō′*), PIERRE MARIE ERNEST, statesman, born at Nantes, France, Dec. 2, 1846; died Aug. 10, 1904. After completing his general education, he studied law and in 1879 was elected deputy from Rennes. In 1881 he became minister of the interior and held that position most of the time until 1885. He was chosen a senator from the department of the Loire in 1894 as a moderate republican, and, after the fall of the cabinet of Dupuy, in 1889, he formed a new ministry, whose members, though differing widely on economic questions, were firmly united upon the position of sustaining the republic against the clericals and royalists. In 1900 he sanctioned reopening the Dreyfus case and gave support to a general amnesty law for all who had been connected with it. He resigned in 1902, after taking a prominent part in gaining success for republican principles in the general election that year. His published works include: *"Questions sociales," "Discours parlementaires,"* and *"La défense républicaine."*

Walden Pond (*wa̤l′dẹn pŏnd*), a small lake in Massachusetts, noted as the scene of Henry Thoreau's philosophic contemplation of the simple, individualist existence. The journal kept by Thoreau (*q.v.*) during his two-year sojourn in the woods was subsequently published under the title of "Walden."

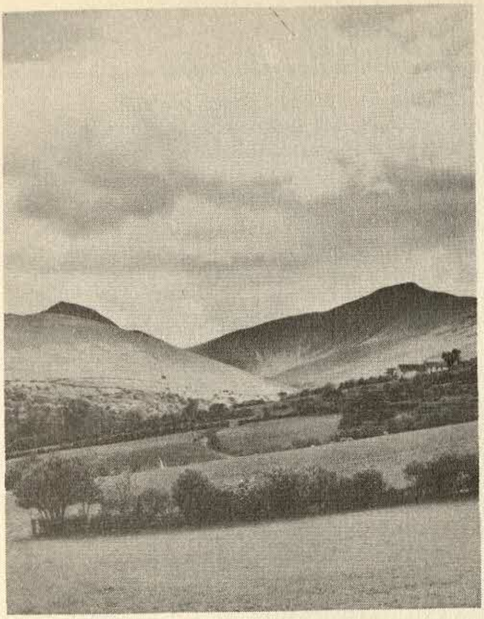
Waldenses (*wŏl-dĕn′sēz*), a Christian sect founded in Italy by Petrus Waldus (Peter Waldo), an influential merchant of Lyons. He became the leader of a considerable number who looked upon the church and the clergy as corrupt and went forth to preach with the view of bringing about a reformation, though not intending to secede from the established organization. The study of the Bible in translation caused his decision to live in voluntary poverty and in about 1170 he sold his possessions and devoted the proceeds to the Christian cause. His French followers, the so-called Paupers of Lyons, later united with the Humiliates of Milan, a similar sect. The Archbishop of Lyons published a command charging that Waldo's followers refrain from further activity. They appealed to Pope Alexander III, but he prohibited their meetings. At many church councils, beginning in 1179 and continuing through the whole 13th century, their teaching was condemned, especially because of the stress they placed on the Bible and because they allowed laymen to preach. Finally, their followers concentrated in the valleys of Piedmont and Savoy. The reform movement continued and gained strength steadily until the 16th century, when widespread persecutions took place. Pope Sixtus IV, in fact, had organized a crusade against them as early as 1477. After the Reformation, a certain part of the Waldenses united with the Reformed Protestant Church.

Large numbers emigrated in 1681 to Switzerland and Germany, where they were given entire freedom of conscience. In 1848 religious liberty was granted to them, and soon they were given equal political rights with the Roman Catholics in Italy. Their chief seat was established southwest of Turin, but there are about 20,000 in Germany and Switzerland. The Waldenses hold the Bible as the only rule of faith, but adhere to their confession of belief published in 1855, which they consider the most accurate of Biblical interpretations.

Waldersee (*väl′dẽr-zâ*), ALFRED, COUNT VON, military leader, born in Potsdam, Germany, Apr. 8, 1832; died Mar. 5, 1904. He received a general and military education and in 1850 entered the army. He served in the Austro-Prussian War of 1866 and also in the Franco-Prussian War of 1870-71. He was aide-de-camp of the King of Prussia in the latter war and rendered gallant services at the surrender of Sedan and in the siege of Paris. He was made quartermaster general in 1882, and Emperor William II promoted him to the rank of field marshal in 1895 for his success at the annual maneuvers of the German army near Stettin. He was chosen commander-in-chief of the allied armies in China in 1900. Count von Waldersee married, in 1874, Mary Esther Lee, of New York, the widow of Prince Frederick of Schleswig-Holstein.

Waldeyer's Ring (*väl′dī-ẽrz rĭng*), a term in physiology. See *Tonsils.*

Wales (*wālz*), a principality of Great Britain, occupying a peninsula projecting westward from the Midlands of England. Its width ranges from about 35 to 95 m. It is bordered on the E. by the



Courtesy British Information Services, N. Y.

BRECKNOCK BEACONS IN SOUTH WALES

Courtesy British Information Services, N. Y.

MINING TOWN IN SOUTH WALES

English counties of Cheshire, Shropshire, Hereford, and Gloucester; on the N. by the Dee estuary and the Irish Sea; on the W. by St. George's Channel and the mouth of the Bristol Channel. Politically it is a part of Great Britain, being divided into 12 counties. The position of the English county of Monmouth is anomalous, as the majority of its population are Welsh in origin, speech, and habits. Many laws applying to Wales, such as the Welsh Intermediate Education Act, apply also to Monmouthshire.

DESCRIPTION. Wales is a mountain mass divided by rivers. The average elevation is 1,100 ft.; the chief mountain systems are those of North Wales (Mt. Snowdon, 3,500 ft.), Berwyn, Powys, the Black Mts., Brecknock Beacons, and the Black Forest Ranges. The only lowlands are those of the Dee, the Severn, the Wye, and the narrow coastal plain.

AGRICULTURE AND INDUSTRY. Agriculture, because of the surface of the country, is mostly pastoral: cattle, sheep, and the raising of stock-feeding crops. Of these, oats is the most important. Milk, cheese, and butter are produced mainly for the English market. Important sheep fairs are held annually at Newton, Oswestry, Builth, and Devils Bridge.

Coal, iron, and steel are the basic industries of Wales. The South Wales coal field, the second largest in Great Britain, extends from Monmouthshire in the east to St. Bride's Bay, Pembrokeshire, in the west, a distance of about 90 m., and is served by the ports of Newport, Barry, and Cardiff. The last named is the largest coal port in the world. Iron is mined in the north and east of this field at Merthyr, Aberdare, Tredegar, and Pontypool. The tin-plate industry is concentrated around the port of Swansea.

In North Wales the coal industry at Gresford and Llay Main have now been eclipsed by other industries: lead and zinc mining at Holywell, artificial silk at Flint, chemicals at Cefn, papermaking at Holywell and Flint, and bricks and tiles at Ruabon.

Other important industries are slate mining in Caernarvon and Denbighshire: fishing at Milford Haven, Swansea, and Cardiff; wool and leather at Caemarthan, Cardigan, and Pembroke.

EDUCATION. There are good public schools, and several excellent institutions of higher learning are maintained, notably the Univ. of Wales, with four colleges at Cardiff, Aberystwith, Bangor, and Swansea.

HISTORY. Wales was invaded by the Romans when they occupied Britain, but the inhabitants, protected by the mountains, long resisted the intruders. These inhabitants, of Celtic origin, were known as *Cymri,* meaning "countrymen" or "not foreigners." The Romans divided the country into districts and called it Cambria. The Anglo-Saxon term *Welsh,* meaning "foreigners," was later adopted for the inhabitants. The Welsh, at first divided into a number of small tribes, were united by King Roderick the Great in the 9th century. The English finally compelled the Welsh to pay tribute to Athelstan and later to Harold. Llewellyn, the last of the Welsh princes, revolted against Edward I, but was slain in a battle against the

Earl of Mortimer in 1282. He was succeeded by his brother David, who assumed the title of Prince of Wales, but was captured in a battle and executed.

The country has been part of England since 1284. In 1301, Edward I created for his son the principality of Wales, to bring that country more firmly under his domain. A final effort for independence was made by the Welsh under Owen Glendower, lasting 15 years, from 1400-15. Upon Glendower's death, the Welsh submitted to Henry IV. Relations between the two countries were improved after the accession of the House of Tudor in 1485 (in the person of Henry VII), since the Tudor line was of Welsh extraction. In 1536 Wales was united with England on a basis of equality. For later history, see *England; Great Britain.*

Language and Population. The Welsh language is similar to that of the ancient Britons, but has been greatly improved since the invention of printing. The alphabet has 7 vowels and 13 simple and 7 double consonants, but numerous diphthongs and tripthongs are employed. Although the Welsh language is spoken exclusively by only 3 per cent of the population and 31 per cent are bilingual, Welsh is spoken in three-quarters of the area of Wales.

Many associations have been organized to foster interest in the Welsh language and literature. The national bardic festival (*Eisteddfod*), instituted in 1176, was revived during the 19th century. The early romances and tales of Welsh literature date from the 8th century, including a collection called the "Mabinogion," and the earliest printed book in the Welsh language dates from 1546. Its literature includes works of importance in history, theology, science, and biography.

The population is *ca.* 2,160,000; about half live in the county of Glamorgan.

Wales, PRINCE OF. See *Prince of Wales.*

Walhalla (*wăl-hăl'ȧ*). See VALHALLA.

Walker (*wạk'ẽr*), AMASA, political economist, born in Woodstock, Conn., May 4, 1799; died Oct. 29, 1875. After attending college, he entered business, and in 1842 became a lecturer on political economy in Oberlin Coll., Ohio. He was elected a member of the Massachusetts assembly in 1848 and of the senate in 1849, where he secured the passage of a bill placing "Webster's Dictionary" in the common schools of Massachusetts. He served as Secretary of State from 1851-52 and as a member of Congress from1862-63. From 1859-69 he delivered lectures on political economy in Amherst Coll. He was one of the founders of the Free Soil party and became noted as an active worker for temperance. His writings include "Science of Wealth" and "Nature and Uses of Money." He contributed a series of articles to *Hunt's Merchants' Magazine.*

Walker, FRANCIS AMASA, statesman and statistician, born in Boston, Mass., July 2, 1840; died Jan. 5, 1897. He was a son of Amasa Walker, was graduated from Amherst in 1860, and served in the Union Army during the Civil War. His services at Chancellorsville won much praise, and in 1865 he was brevetted brigadier general. From 1865-67 he taught Latin and Greek at Williston Sem., served as U.S. Indian commissioner in 1872, and was professor of political economy at Yale Univ. from 1873 to 1881. He became president of the Massachusetts Inst. of Technology in 1881. He attended an international monetary conference at Paris in 1878. Walker wrote several well-known books and was honored by several foreign associations. His publications include: "Trade and Industry," "The Wage Question," "Bimetallism," "The Indian Question," "Political Economy," and "Statistical Atlas of the U.S."

Walker, FREDERICK, painter, born in London, England, May 24, 1840; died June 4, 1876. He studied at the Royal Acad. and under private tutors and took up the work of an illustrator and wood engraver. After 1865 he devoted his time chiefly to works in water colors and paintings in oils. He exercised a wide influence upon art in his native country by producing works of much originality and richness in coloring. Among his chief paintings are: "The Wayfarers," "The Harbor of Refuge," "The Right of Way," "The Bathers," "Philip in Church," and "The Vagrants."

Walker, JAMES J., politician, born in New York City in 1881; died there Nov. 18, 1946. Born and reared in the Greenwich Village section of New York City, he studied intermittently at New York Law School for some years, finally gaining admission to the bar in 1912. When his father retired from politics in 1909 he was named to take his place in the Assembly. At Albany he became an associate of Alfred E. Smith (*q.v.*), then a rising assemblyman. He was elected to the state senate in 1915, and in 1920 became minority leader of that body. His outstanding accomplishments there were his senate bills legalizing professional baseball games on Sundays and professional boxing bouts of 15 rounds to a decision.

He was elected mayor on the Democratic ticket in 1925, taking office on Jan. 1, 1926. A series of scandals started early in his first term. The forced resignation of his first police commissioner gave rise to charges of political maneuvering, and his efforts in behalf of a franchise for an unsound bus company also came under fire. During his first two years in office he went on seven vacations, aggregating 143 days. In 1929, however, he was re-elected by a record plurality; afterward his salary was increased by $15,000 to $40,000 annually.

Courtesy Municipal Reference Library, N. Y.

JAMES J. WALKER

In 1931 the City Affairs Committee of New York filed a petition with the incumbent governor, Franklin D. Roosevelt, demanding Mayor Walker's removal. The Hofstadter investigation resulted, and, with Samuel Seabury (*q.v.*) as special prosecutor, the probe continued for one and a half years. Walker nonchalantly made a two-month visit to Europe, returned, and on May 14, 1932, took part in his last official celebration—a big "beer parade," in which the marchers carried banners reading, "Jimmy Walker for President and Beer for All." In August he went to Albany and pleaded innocence to the allegations made against him in the Seabury findings. Finally, on Sept. 1, 1932, he wrote a bitter letter of resignation, and in November went to live in Europe.

He returned to New York City in 1935, but did not enter public life again until 1940, when he was named impartial chairman of the cloak and suit industry in New York, at a salary of $20,000 a year. Five years later he became president of a private business firm in which he was active until his collapse, one day before his death, from cerebral thrombosis. He was the author of one popular song, which he wrote in his youth, "Will You Love Me in December as You Do in May?"

Walker, MARY EDWARDS, physician and feminist, born at Oswego, N.Y., in 1832; died in 1919. A descendant of early Plymouth Colony settlers, she received her primary education at a school near Oswego conducted by her father, Alvah Walker, who was a doctor and farmer as well as a teacher. At 16 years, she taught school in New York City, where she was drawn into the woman's rights movement. She began to wear clothing like that of a man, a custom which she continued, except for a few intervals, for the rest of her life. She completed a medical course and received a physician's certificate at Syracuse (N.Y.) Medical Coll., in 1855. During the first three years of the Civil War she was a nurse in the Union Army. In October 1864 she was commissioned an assistant surgeon in the army, serving in that capacity for nine months until her resignation, and wearing a uniform almost exactly like that of men officers. She was one of the first newspaperwomen in New York City for a brief period, and then started medical practice in Washington, D.C. There her frock coat and striped trousers became a familiar sight and frequently evoked ridicule. Arrested several times for "masquerading in men's clothes," she claimed she had Congressional permission to dress as she did. She originated several minor inventions, including the return postcard sent out with registered mail. She also found time to write two books, but most of her activity was in connection with the movement for women's emancipation.

Walker, WILLIAM, adventurer, born at Nashville, Tenn., May 8, 1824; executed Sept. 12, 1860. He was graduated from the Univ. of Nashville, and pursued advanced courses at Edinburgh and Heidelberg. In 1850 he returned to the U.S. and became an editor and journalist in California. Three years later he organized an expedition to conquer the northwestern part of Mexico, where he undertook to found a republic, and after capturing a number of small towns proclaimed himself president. A strong force of Mexicans was sent against him, but he crossed the boundary and at San Diego surrendered to officials of the U.S., by whom he was acquitted on the charge of having violated the neutrality laws. In 1855, taking advantage of a civil war in Nicaragua, he invaded that country and captured Grenada. He formed an alliance with Gen. Corral, the president, who made him the chief military officer. They soon quarreled, and Walker, taking advantage of the unrest in the country, captured Corral and had him convicted and shot for conspiracy. Walker proclaimed himself president, but his arbitrary government caused him to be expelled from Grenada. He surrendered to the U.S. authorities and was taken to New Orleans, but soon invaded Nicaragua a second time. Again driven from the country, he made an unsuccessful attempt to conquer Honduras, where he was court-martialed and shot at Truxillo.

Walking Stick (*wạk'ing stĭk*), the popular name of several insects found in the warm climates and in the warmer part of the Temperate Zones. They belong to the leaf insects and very closely resemble the stalks of grass and other plants among which they live. The common walking stick is about 3 in. long. It has a jointed body and four jointed legs. Those found in the tropics are much larger, frequently 9 or 10 in.

long. Some of these insects have the form of twigs and leaves, but the majority are cylindrical like a small stick.

Wallace (*wŏl′ĭs*), county seat of Shoshone County, Idaho, on Placer Creek, 110 m. E. of Spokane, Wash. It has transportation facilities by the Northern Pacific R.R. and the Oregon R.R. & Navigation Co. The surrounding country produces large quantities of gold, silver, and lead. Mining is an important industry. It has manufactures of lumber products, machinery, bread, mining supplies, and utensils. Wallace was founded in 1884 and was incorporated in 1892. Population, 1940, 3,839; in 1950, 3,140.

Wallace, ALFRED RUSSEL, discoverer with Charles Darwin (*q.v.*) of the theory of evolution (*q.v.*), born Jan. 8, 1823; died in 1913. He was a naturalist and beetle-collector who early explored the Amazon, and later the Malay Archipelago. He divided the East Indies into eastern and western zoological zones, in which animal life stemmed from either Oriental or Australian sources. Here he hit on the theory of the survival of the fittest. His observations were drawn from animal as well as insect life.

He sent his findings to Darwin, then a stranger, who declared them to be a perfect abstract of his own thesis. The Wallace and Darwin theories were presented in a joint paper in 1858. In 1870 Wallace published a completed statement, "Contributions to the Theory of Natural Selection."

Wallace, EDGAR, writer, born in England, in 1875; died in 1932. His varied career included work as newsboy, popular-song composer, reporter, war correspondent, playwright, and finally prolific writer of detective and mystery thrillers. In addition to numerous plays he produced over 150 novels with book sales topping 10,000,000 copies. Working at tremendous speed, he is said to have been able to complete a novel in two days. Among his stories were "The Green Archer," "The Man at the Carlton," and "The Terror." He also wrote scenarios.

Wallace, HENRY, agricultural leader, born in 1836; died in 1916. Born on a farm in western Pennsylvania, he went to Iowa as a home missionary of the United Presbyterian Church. Ill health forced him to turn to farming, and he soon had one of the finest farms in the region. He began writing agricultural articles for the *Iowa Homestead,* later assuming a financial interest in it. With his sons he founded (1895) *Wallace's Farmer,* a journal that was soon to become recognized as one of the nation's leading agricultural publications. His son, HENRY CANTWELL WALLACE (born in Rock Creek, Ill., May 11, 1866; died Oct. 25, 1924), was graduated from the Iowa State Coll. of Agriculture, later joining his father's magazine. He was assistant editor until 1916, becoming editor upon his father's death in that year. He served as president of the Corn Belt Meat Producers' Association and as a member of the War Finance Corp. and of the Food Administration. Despite the opposition of the meatpacking interests, President Harding appointed him Secretary of Agriculture, and he continued to serve in that position during the administration of President Coolidge, dying in office. While in the cabinet he reorganized his department and consolidated several divisions into the Bureau of Agricultural Economics.

Wallace, HENRY AGARD, public official, born on a farm near Orient, Ia., Oct. 7, 1888. He is a son of Henry C. Wallace, who was U.S. Secretary of Agriculture under President Harding. He received his education at Iowa State Coll., from which he was graduated in 1910. As associate editor (1910-24) and editor (1924-29) of *Wallace's Farmer* and later editor of the consolidated *Wallace's Farmer and Iowa Homestead* magazine he became widely recognized and quoted. President F.D. Roosevelt called him to the cabinet as Secretary of Agriculture in 1933. He advocated the domestic allotment plan as originally formulated by farm experts, and advanced this plan as a necessary aid to enable agriculture to complete readjustment necessitated by changed world conditions. He instituted the Agricultural Adjustment Act, a program to stabilize farm income through controlled crop and livestock production, soil conservation, and the storage of surplus crops to make the "ever-normal granary."

Wallace early became one of Roosevelt's principal and most trusted advisers. Not only was he a wholehearted supporter of New Deal measures, but it is generally believed that many of them actually originated with him.

In 1940, he was elected Vice President of the U.S., serving for one term. In the course of his tenure in this office, Wallace traveled extensively, to Russia, China, South America, etc., at the same time gaining a wide knowledge of foreign affairs. He usually addressed the peoples of the countries he visited in their own language, advancing a "one world" point of view.

In 1945, he became U.S. Secretary of Commerce, devoting his energy to postwar employment problems, particularly that of full employment. After the death of President Roosevelt, he was considered to be the leader of the liberal wing of the Democratic party.

In September 1946 Wallace made a speech endorsed in advance by President Truman advocating a more friendly policy toward Russia. The speech aroused excited praise and criticism, his critics alleging that it sabotaged the policies of Secretary of State Byrnes. Two days later Truman announced that he had meant only to support Wallace's right to make the speech, without

HENRY A. WALLACE

endorsing the contents of the speech itself. A week later he asked for Wallace's resignation as Secretary of Commerce, and Wallace became editor of the liberal weekly, the *New Republic.* In 1947, on a trip to Europe, Wallace delivered a series of addresses in which he vigorously criticized the newly established "Truman doctrine" of aid to Greece and Turkey (see *United States*). These speeches evoked outspoken opposition in some quarters. In 1948 he was the unsuccessful Presidential candidate of a new party, the Progressive Party, pledged to maintain peace and full employment. Wallace remained leader of the Progressives until 1950 when he resigned because of the party's failure to support the U.N. action in Korea (*q.v.*). Wallace is the author of "The Century of the Common Man" (1943), "Sixty Million Jobs" (1945), and "Toward World Peace" (1948).

Wallace, LEWIS (known as LEW), soldier and author, born in Brookville, Ind., Apr. 10, 1827; died Feb. 15, 1905. He studied law and began practice at Crawfordsville, Ind. At the beginning of the Mexican War, he volunteered and was made first lieutenant. He practiced law from 1848-61 and in the meantime served a term in the Indiana legislature. He was appointed adjutant general of Indiana at the beginning of the Civil War, and soon became a colonel. In 1861 he defeated the Confederates at Romney, W. Va. In 1864 the Confederates defeated him at Monocacy, but he detained the enemy long enough to enable Grant to prevent the capture of Washington. Wallace served on the court that tried the assassins of President Lincoln. He was governor of New Mexico from 1878 to 1881, and minister to Turkey from 1881 to 1885. He is the author of "Ben-Hur, a Tale of the Christ," which had a tremendous world-wide sale and which was translated into numerous foreign languages. Other writings include "The Fair God," a story of the conquest of Mexico, "The Prince of India," and "The Life of Benjamin Harrison."

Wallace, SIR WILLIAM, patriot and soldier of Scotland, born about 1270; executed in London, England, Aug. 23, 1305. It is thought that he was a son of Sir Malcolm Wallace of Ellerslie and that he studied at Dundee, where he probably developed his heroic love for the independence of Scotland. He is noted for courage, physical strength, and the brave devotion with which he fought against Edward I, King of England, to maintain the freedom of his native land. He gathered a small band of his countrymen and made several successive attacks on the English, inducing a number of the Scotch barons to join him. At last the Earl of Surrey, English governor of Scotland, marched against him with an army of 50,000 men, but Wallace succeeded in defeating the English at Stirling Bridge, on the banks of the Forth, Sept. 10, 1297. He immediately followed up his victory by invading the northern counties of England and, on returning to Scotland, was made guardian of the kingdom. The English gathered an army and invaded Scotland and, being deserted by a number of Scottish nobles, Wallace was defeated at Falkirk on July 22, 1298. He and a number of followers fled to the mountain districts, but a large reward was offered and he was betrayed and captured. Wallace was taken to London, where he was given a mock trial and executed as a traitor. His head was exposed on London Bridge as a warning to those who opposed King Edward. On the summit of Abbey Craig, near Stirling, is a memorial to Wallace.

Wallach (*väl'äk*), OTTO, chemist, born in Königsberg, East Prussia, Mar. 27, 1847; died Mar. 18, 1931. He taught at the universities of Berlin and Bonn before joining the faculty at Göttingen in 1889, where he remained until his retirement in 1915. Wallach's field was organic chemistry and he contributed many discoveries to the advancement of his subject. His pioneer work on alicyclic combinations and his research in general won for him the 1910 Nobel Prize for chemistry. Wallach wrote several books on his research, the most important of which was "Terpene and Camphor" (1909).

Wallachia (*wŏl-ā'kĭ-à*), or MUNTENIA, a fertile plain district of southern Europe which was joined with the neighboring country of Moldavia in 1861 to form the Kingdom of Rumania (*q.v.*). The region is divided into the two districts of *Little* and *Great Wallachia* with approximate areas of 10,000 and 20,000 sq. m., respectively. See *Rumania.*

Wallack (*wŏl'ăk*), JOHN (LESTER), actor, born in New York City, Jan. 1, 1820; died Sept. 6, 1888. He became interested in the stage at an early age, but did not make his appearance at the New York Bowery Theater until 1847, when he made a success as *Sir Charles Coldstream* in "Used Up." His father, JAMES WILLIAM WALLACK (1794-1864), a British actor, in 1861 established the Wallack Theater in New York City, of which the son became the proprietor in 1864, thereafter conducting that theater for 24 years. He wrote a number of pieces for the stage, including "Rosedale" and "The Veteran." *Scribner's Monthly* published a series of articles written by him.

Walla Walla (*wŏl′ȧ wŏl′ȧ*), county seat of Walla Walla County, Washington, 242 m. N.E. of Portland, Ore. It is served by the Northern Pacific, Union Pacific, and other railroads. The city is the hub of a fertile agricultural region that raises wheat and other cereals, sugar beets, fruits, and vegetables. Livestock and poultry are also raised, and dairying is an important industry. Foods are canned and frozen, vegetable seeds packaged, and farming equipment and tin cans are manufactured.

Walla Walla is the seat of Walla Walla Coll. and of Whitman Coll., which was founded in 1859 and is the oldest college in the state. A veterans hospital, located on the site of Ft. Walla Walla, and a state penitentiary are within half a mile of the city. Other points of interest are the Baker-Boyer National Bank, the oldest in the state, the Whitman Museum, and Chief Lawyer Monument. Walla Walla was first settled in 1836 by Marcus Whitman, a missionary who was massacred in 1847 by the Indians. The town was founded in 1858 and incorporated as a city in 1862. Population, 1940, 18,109; in 1950, 24,102.

Wallenstein (*wŏl′ẹn-stīn*), ALBRECHT EUSEBIUS WENZEL VON, German soldier, born in Hermanitz, Bohemia, Sept. 24, 1583; assassinated at Eger, Feb. 25, 1634. His father and mother were members of the Bohemian Evangelical Church, but both died while he was young, and he was sent to the Jesuit Coll. at Olmütz. While there he embraced the Roman Catholic faith. Subsequently he studied at Altdorf, Bologna, and Padua, and afterward visited many parts of France, Germany and The Netherlands. Later he joined the imperial army for service in Hungary against the Turks, and at the close of the war, in 1606, married a widow of noble rank. She died in 1614, leaving him a vast fortune, which enabled him to offer 200 horses to the Archduke Ferdinand for his war with Venice. For this he received the title of count and the military rank of colonel. When the insurrection broke out in Bohemia, he firmly adhered to the imperial side, and at the cessation of hostilities purchased a number of estates which he erected into the state of Friedland. Ferdinand II, who felt impelled to recompense the valuable service of Wallenstein, made him a prince of the empire and conferred upon him the title of Duke of Friedland. He raised an army of 30,000 men in 1626 to aid Emperor Ferdinand and allied his forces with Tilly, the German military leader, against Christian IV of Denmark and Gen. Mansfield. Tilly defeated Christian IV at Lutter and Wallenstein overcame the forces of Mansfield at the bridge of Dessau. He was, however, unsuccessful in his scheme to conquer the Hanseatic town of Stralsund (1628), conquest of which was to have been the first step in undermining the naval supremacy of the Scandinavian countries. Nevertheless, Christian IV was compelled to agree to a treaty of peace in 1629.

ALBRECHT VON WALLENSTEIN

Though an efficient military leader, Wallenstein had many enemies among the nobles and the people; the former were jealous of his successes and the latter felt outraged by the vast destruction of property by his army. Ferdinand finally dismissed him from the service in 1630 and he retired to Gitschin, capital of his duchy of Friedland. However, when Gustavus Adolphus invaded Germany, he was promptly recalled to the service and made commander of the emperor's forces (1632). An army of 40,000 men was placed at his disposal, with which he expelled the Saxons from Bohemia and laid waste a large portion of that country. Sweeping northward to expel the invading Swedes, he fought the battles of Nuremberg and Lützen (1632), but in the latter he was entirely defeated, though Gustavus Adolphus was among the slain. Wallenstein failed to make use of the temporary advantage following the death of the Swedish leader, probably, though not certainly, because he was planning to make himself sovereign of Bohemia. This scheme, if it actually was a scheme, was discovered and an order was issued from Prague in which he was charged with treason. He took refuge with a small band of adherents at Eger, where he was later assassinated.

Wallenstein was one of the most famous military leaders employed by the Catholic League and its supporters in the Thirty Years' War, although that organization was under the leadership of Maximilian, Duke of Bavaria, who had led the campaign to oust him in 1630.

Waller (*wŏl'ẽr*), EDMUND, poet, born at Coleshill, England, Mar. 3, 1606; died Oct. 21, 1687. Descended from an ancient and wealthy family, he studied at the Univ. of Cambridge, and obtained a seat in Parliament at the early age of 18. At first he was opposed to the Royalists, but was won over by them and entered what is known as the Waller's Plot to restore royal authority. This plot was discovered and he confessed, but escaped with a heavy fine and banishment, while a number of his companions were hanged. In 1653 he was permitted to return, and he became a close friend of Cromwell. The remainder of his life was spent largely in literary work, but he again entered Parliament in 1661. His poems are noted for correct versification and are written with the smoothness of those of Pope and Dryden. The two poems by which he is best known are "On a Girdle" and "Go, Lovely Rose."

Wall Flower (*wạl flou'ẽr*), genus of plants which grows in south and middle Europe and Great Britain. It flourishes in rocky ground and has yellow flowers in its wild state and multicolored ones when cultivated. See color plate, *Flowers of the World I,* Volume V.

Wallingford (*wŏl'ĭng-fẽrd*), a town and borough in New Haven County, Connecticut, 12 m. N.E. of New Haven, on the Quinnipiac River. It is served by the New York, New Haven & Hartford R.R. The town trades in merchandise and general manufactures, which include brassware, hardware, tools, clothing, rolled steel, buttons, wire goods, resins for plastics, fireworks, silverware. Among the noteworthy buildings are the Rev. Samuel Street house (built about 1673); the Samuel Parsons house, headquarters of the Wallingford Historical Society; the Caleb Atwater House and Store, built in 1774 and 1775 respectively; the Nehemiah Royce House, dating from 1672; and the Choate School. The community of Wallingford was settled in 1670 and was incorporated in 1853. Population, 1950, 11,994.

Walloons (*wŏ-lōōnz'*), a class of people occupying the southeastern part of Belgium, especially the provinces of Liége, Arlon, and Namur. They are descendants of the Gallic Belgae and eluded the German conquerors by taking refuge in the Ardennes Mts. Ultimately their language became mixed with the French, but it still retains much of the Gallic. They resemble the French more closely than they do the Germans. Their number is steadily increasing, a fact giving rise to political contests between them and the Flemish. Many of the eminent statesmen of Belgium have had Walloon ancestry. The Walloon inhabitants of Belgium are placed at *ca.* 4,000,000.

Courtesy French Press & Information Service, N. Y.

FRENCH WALLPAPER, EARLY 19th CENTURY

Wallpaper (*wạl'pā-pẽr*), or PAPER HANGINGS, a class of ornamental papers manufactured to decorate the interior walls and ceilings of buildings, mostly dwellings, to which they are pasted. Paper of this class was first manufactured in China; about the middle of the 18th century wall paper began to be produced in Europe and has ever since been in use in the Occident. The designs are printed mostly by machines, corresponding to the methods by which calicos are printed. A grade of paper having a velvety surface is called *flock paper,* and is made by fastening shearings of woolen cloths to the paper by means of varnish. The finest grades of paper are hand-painted. The design and color scheme of wallpapers have, of course, always been influenced by general style and taste of the respective periods.

Wall Street (*wạl' strēt*), one of the early streets of lower Manhattan, New York City. It has become the center of financial enterprise. This street and the surrounding area house the important commercial exchanges, many banking and brokerage houses, and the major financial institutions. Hence the term "Wall Street" has come to represent New York and world finance.

Walnut (*wạl'-nŭt*), an extensive genus of valuable and beautiful trees, which are prized for their wood and for the edible nut borne by most of the species. Thirty species have been catalogued, the larger number of which are native to America. The *black walnut* is the most valuable species found in Canada and the U.S. The nuts are inferior for the market to those of the Persian, or English, walnut, but they are richer and juicier. The wood is hard and durable, has a reddish-black color, and is of much value in the manufacture of furniture, musical instruments, and gum stocks. Black walnut trees attain a diameter of 3 to 6 ft. and a height of 40 to 70 ft. The nut matures about the first of October. It is surrounded by a thick, greenish husk, which turns black when dried. The oily kernel is enclosed in a hard shell and is used in making walnut oil, in culinary arts, and for eating. Another widely distributed species is the white *walnut,* or *butternut,* which yields a nut somewhat less flavored, and its wood is not so valuable and durable as that of the black walnut. The *common walnut* of Europe and Asia is a fine, spreading tree and produces excellent wood and edible nuts. These nuts are gathered in the fall and sold in large quantities. They yield the products called walnut oil and nut oil, which are used as food and by painters. In some countries walnut oil is burned in lamps; it is also used for the finer printing inks.

Walpole (*wạl′pōl*), HORACE, author, son of Sir Robert Walpole, prime minister under George II, born Sept. 24, 1717, at London, England; died there, Mar. 2, 1797. He had the approved education of the rich man's son of that time: Eton, Cambridge, and two years of the "grand tour" in Europe. On his return he was elected to Parliament, but within a few years he retired from politics to pursue the more congenial life of man of fashion, collector, letter-writer, and friend of most of the famous people of his day. With his friend, Thomas Gray, he led the revival of interest in the Middle Ages. His house, Strawberry Hill, became a showplace of Gothic revival in architecture. He filled it with his vast collections of art objects and even set up a printing press there, which he called *"Officina Arbuteana."*

HORACE WALPOLE

Drawing by George Dance (1741-1825)

His novel, "The Castle of Otranto," is one of the famous "Gothic" (*i.e.,* horror) novels, for which he set the fashion. It uses the medieval setting of all such novels. Walpole has been called "the best letter-writer in the language." Among his noted correspondents were Sir Horace Mann and Mme. du Deffand, center of the most brilliant literary salon in Paris. His diaries record mainly the political life of the time and were called "Memoirs of the Reigns of George II and . . . of George III." Walpole did not marry. Late in life he inherited from a nephew the title of 4th Earl of Orford, but he never took his seat in the House of Lords.

Walpole, SIR HUGH SEYMOUR, novelist, born in New Zealand in 1884; died in 1941. He was reared in Cornwall, England, and was educated at King's School, Canterbury. For a number of years he was a teacher and meanwhile became interested in literature. During World War I he served in the Red Cross, mostly in the Carpathian Mts. area of Russia. His books include: "The Wooden Horse," "Mr. Perrin and Mr. Traill" (pedagogical), "The Cathedral," "Portrait of a Man with Red Hair," "Rogue Herries," "Judith Paris," "Vanessa," "The Fortress," "The Inquisitor," "John Cornelius," "The Sea Tower," "The Bright Pavilions," and "The Killer and the Slain."

Walpole, SIR ROBERT, Earl of Orford, statesman, born at Houghton, England, Aug. 26, 1676; died in London, England, Mar. 18, 1745. He studied at Eton and Cambridge and in 1701 entered Parliament. In 1708 he was made secretary of war and in 1710 became, in addition, treasurer of the navy. In 1712, he was falsely accused of corruption and sent to the Tower, but was eventually released. Walpole was noted as an influential member of the Whig party and his powers were exercised to establish the Hanoverian succession. After George I came to the throne, Walpole was first made paymaster-general of the forces and shortly thereafter first lord of the treasury. In 1715 he was appointed chancellor of the exchequer, but was forced to resign two years later. In 1720, however, he again became paymaster of the forces and in the following year, after the failure of the South Sea Bubble, he was recalled to the cabinet in the hope that he would be able to restore both financial and political order. From 1721 until 1742 he served as prime minister. His policy was to promote sound government finance and to keep free of foreign wars, and on the whole he was remarkably successful and popular. However, in 1739, he was forced into war with Spain and in 1742 resigned and was made Earl of Orford. Shortly after, charges of corruption were brought against him, but the proceedings were dropped for want of evidence. Walpole exercised an influence for good, chiefly by promoting the commercial development of Great Britain, and by reforms in the tariff laws.

Walpurgis Night (*väl-pŏŏr′gĭs nīt*), or WALPURGA, the name applied in Germany to the eve of May 1, when, according to legends, the witches were supposed to assemble at some appointed rendezvous, such as the highest point of the Hartz Mts. The legends of Walpurgis Night had their origin in the 8th century, when St. Walpurgis established convents and several societies in that country. May 1 was named as the day to commemorate her because a heathen festival was formerly held at that time and her feast was appointed to take its place, though it properly should be held on Feb. 25. See also *Brocken; Witchcraft.*

Walrus (*wạl′rŭs*), a fin-footed marine mammal of huge size having the upper canines greatly enlarged in the form of long tusks. It is closely allied to the seal and sea lion and is included in the suborder Pinnipedia.

The ATLANTIC WALRUS (*Odobenus r. rosmarus*) is found in the North Atlantic Ocean, the adjacent Arctic seas, and south to the coast of Labrador but rarely travels south of the Arctic Circle. The PACIFIC WALRUS (*Odobenus r. divergens*) resembles the Atlantic walrus but has longer, heavier, and more divergent tusks. It is found in the Bering Sea north to the Arctic Ocean. Its relatively small head, armed with a pair of long ivory tusks, its huge size, and its practically hairless body are characters sufficient to identify the walrus. Its hind limbs are capable of rotation forward like those of the sea lion but there is no trace of an external ear. A large walrus may weigh about 3,000 lbs. and measure 11 ft. in length, and the tusks up to 30 in. Both sexes have tusks, but they are heavier in the males. The skin of the adult is brown in color, wrinkled and creased and practically devoid of hair, but on the muzzle are numerous coarse, stiff bristles. The walrus feeds largely on clams and other shellfish that occur on the floor of the seas in its habitat. Often descending 180 ft. below the surface, the walrus uses its tusks to dig the clams or break them loose from the rocks. These shellfish are then broken up by the molar teeth and swallowed shell and all. The tusks are of great service in climbing on the slippery ice and also serve as formidable weapons of defense and attack. Walruses, like most of the Pinnipedia, love company and congregate in herds from a dozen to several hundreds. With the exception of man, the killer whale is their greatest enemy, though polar bears do take a limited number of the young, as the walrus is weak in defense.

Courtesy American Museum of Natural History, N. Y.

WALRUS

Walsingham (*wŏl′sĭng-ạm*), SIR FRANCIS, statesman, born in Chiselhurst, England, *ca.* 1530; died April 6, 1590. After studying under private tutors, he entered the Univ. of Cambridge but left that institution to make an extensive tour of Europe. Queen Elizabeth sent him on several important missions to France, where he negotiated terms for the toleration of the Huguenots. In 1573 he was made a secretary of state to Elizabeth. He was sent on missions to the Netherlands (1578) and Scotland (1583). In the latter capacity he obtained letters written by adherents of Mary, Queen of Scots, and through them discovered the Babington conspiracy to murder Elizabeth. Friends of Mary charged him with complicity in bringing about her conviction on forged evidence. This was not proved, although it is known that he regarded her execution as important in making Scotland permanently subject to England. As surety for the debts of Sir Philip Sidney, he became heavily involved and died in poverty. His writings were published under the title "The Compleat Ambassador."

Walter (*väl′tẽr*), BRUNO, conductor, born in Berlin, Germany, Sept. 15, 1876; died in Beverly Hills, Calif., Feb. 17, 1962. After studying at the Stern Conservatory, Berlin, he was a conductor (1901-12) of the Vienna Opera and general music director (1913-22) of the Munich Opera. In 1922 he conducted for the first time at the Salzburg festival seasons, and his first U.S. appearance was in 1923 with the New York Symphony Orchestra. In 1925-29 he was conductor of the Berlin Municipal Opera. He also conducted at Leipzig (1929-33) and the Vienna State Opera (1935-38); and he appeared with major U.S. and European orchestras. Walter became a U.S.

citizen in 1946. Guest conductor of the New York Philharmonic Symphony intermittently from 1932, he was musical adviser (1948-57) and principal conductor (1948-49). He continued guest appearances with major orchestras of the world until 1960. His books include "Gustav Mahler" (1937), "Theme and Variations" (1946), and "Of Music and Music-Making" (1961).

Walter, HUBERT, clergyman and statesman, died in 1205. A nephew of the great jurist Ranulf de Glanvill, he rose to the bishopric of Salisbury in 1189. After accompanying (1190) Richard I (*q.v.*) on the Third Crusade, he became (1193) archbishop of Canterbury and chief justiciar. When Richard again departed, Hubert was in effect ruler of the kingdom. He devised various improved methods of taxation and administration and raised the ransom which purchased Richard's freedom from prison in Austria.

Walter, LUCY, courtesan and mistress of Charles II of England while he was in exile, born in Roch Castle, Wales, *ca.* 1630; died at Paris, France, in 1658. When her father's home was burned by Parliamentary forces (1644), the family took refuge first in London and later in The Hague, where, in 1648, she met Charles. She remained on intimate terms with him until 1651. He acknowledged paternity of her son, James Scott, later duke of Monmouth (*q.v.*), but denied that he had ever been legally married to her.

Walter, THOMAS USTICK, architect, born in Philadelphia, Pa., Sept. 4, 1804; died there, Oct. 30, 1887. In 1819 he entered the office of William Strickland, architect of the Philadelphia mint and customhouse, as a student. Walter designed (1833) the main building of Girard Coll., Philadelphia; this building, completed in 1847, is one of the finest examples of Greek revival architecture in the U.S. In 1851 Walter was appointed architect of the U.S. Capitol in Washington, D.C. To the original building of Charles Bulfinch (*q.v.*), Walter added two wings for the Senate and House of Representatives; he also rebuilt the west front and replaced the dome.

Walter the Penniless, French knight and Crusader, probably killed at Nicaea, Asia Minor, in 1097. In 1096 he led an undisciplined mob through Europe in advance of the First Crusade. Near Belgrade Walter's followers were attacked by the Bulgarians, and many of them perished. When the survivors reached Constantinople, they were joined by the forces of Peter the Hermit (*q.v.*). The emperor Alexius I provided transportation for Walter's and Peter's followers across the Bosporus, but, in their engagement with the Seljuk Turks, at Nicaea, they were annihilated.

Waltham (*wạl'thạm*), a city in Middlesex County, Massachusetts, on the Charles River, 9 m. N.W. of Boston. It is served by the Boston & Maine R.R. and has manufactures of watches (Waltham Watch Co.), shoes, clothing, and machinery. Waltham is the seat of Brandeis Univ., the first nonsectarian institution of higher learning under Jewish sponsorship in the U.S. Waltham was settled in 1634, separated from Watertown in 1738, and incorporated as a city in 1884. Population, 1940, 40,020; in 1950, 47,187.

Walther (*vạl'tẽr*), CARL FERDINAND WILHELM, clergyman and theologian, born in Langenschursdorf, Saxony (Germany), Oct. 25, 1811; died in St. Louis, Mo., May 7, 1887. The son of a clergyman, Walther was educated in theology at the Univ. of Leipzig and ordained in 1837. Disagreeing with the doctrinal position of the Saxon Church, he emigrated to the U.S. (1838–39), settling in Perry County, Mo. A school which he opened in 1839 became the Concordia Theological Seminary when it was moved to St. Louis in 1850. Remaining a pastor, but teaching at the seminary, Walther also was responsible for several books and for two periodicals which espoused a strict confessional Lutheranism, *Der Lutheraner* and *Lehre und Wehre*. A polemical theologian, he was one of the founders of the Missouri Synod (1847) and of the Synodical Conference (1872).

Walther von der Vogelweide (*väl'tẽr fôn dẽr fō'gẹl-vī-dẹ*), poet and minnesinger, born in Austria *ca.* 1170; died in Würzburg, Germany, *ca.* 1230. After a youth spent at the court of Duke Frederick I in Vienna, he became a wandering singer, going from court to court throughout Germany and the neighboring countries. Emperor Frederick II gave him a fief, it is said at Würzburg, and it was in honor of Frederick's crusade to the Holy Land (the Fifth Crusade) that Walther composed his last known poem (1227). He is considered the most accomplished lyric poet of the Middle Ages.

Walton (*wạl'tŭn*), ERNEST THOMAS SINTON, physicist, born in Dungarran, Ireland, Oct. 6, 1903. He was educated at Trinity Coll., Dublin, and at Cambridge Univ., where he and J. D. Cockcroft worked as assistants to Ernest Rutherford (*q.v.*). Walton and Cockcroft designed and built (1932) a machine which they used in the bombardment of atomic nuclei by high-speed atomic particles. Walton became (1934) a fellow of Trinity Coll. and, in 1946, professor of natural and experimental philosophy there. In 1951 he and Cockcroft shared the Nobel Prize in physics for their earlier accomplishments in nuclear physics.

Walton, GEORGE, patriot and statesman, born near Farmville, Va., in 1741; died in Augusta, Ga., Feb. 2, 1804. He moved (1769) to Savannah, Ga., where he established a law practice. He was a delegate to the Continental Congress (1776-78, 1780-81) and signed the Declaration of Independence and the Articles of Confederation. In 1778 he was captured by the British at the siege of Savannah but was released in 1779. He served as governor (1779-80, 1789) and chief justice (1783-89) of Georgia and as U.S. Senator (1795-96) from Georgia.

Walton, IZAAK, author, born in Stafford, England, Aug. 9, 1593; died in Winchester, Dec. 15, 1683. Although he received only a limited formal education, he had the advantage of personal acquaintance with many men of letters during the long period in which he kept an ironmonger's shop in Fleet Street. His literary activities occurred mainly after he had retired from business in 1643. "The Compleat Angler" appeared in 1653 and ran through five editions during the author's lifetime. The "Lives" (of Donne, Wotton, Hooker, and Herbert) was published in 1670. Fitting into no literary category, Walton provides a link between the Elizabethan age and the Restoration.

Doubtless the same intimate and affectionate attitude toward life which is mirrored in the "Lives" has caused "The Compleat Angler" to be so popular. This work is in the form of dialogues carried on by a hunter, a falconer, and an angler, in which each extols the delights of his favorite sport, until the angler vanquishes the others by his eloquence and makes them his disciples. Possibly the only handbook of a craft which actually ranks as literature, this pseudo-pastoral is occasionally derivative in style, but primarily it is a realistic, sensitive, and appreciative description of the meadows, streams, and country inns which the author knew so well.

Walton, SIR WILLIAM TURNER, composer, born in Oldham, Lancashire, England, March 29, 1902. He studied at Oxford and gained his reputation as a composer when his first string quartet was performed (1923) at Salzburg, Austria. His other compositions include "Façade" (1922), an accompaniment to the poems of Edith Sitwell; the overtures "Dr. Syntax" and "Portsmouth Point" (1925); and "Belshazzar's Feast" (1931), an oratorio. Also well known are a viola concerto (1929), a symphony (1935), and a violin concerto (1936-39) commissioned by Jascha Heifetz (*q.v.*). Walton also composed ceremonial marches for the coronations of 1937 and 1953 and music for the films "Henry V" (1945) and "Hamlet" (1947). His opera "Troilus and Cressida" (with a libretto by Christopher Hassall) was first presented in 1954. He was knighted in 1951.

Waltz (*wạlts*), a dance in moderate three-quarter time, which developed in the 18th century from an Austrian peasant dance, the *Ländler,* and has retained its popularity to the present day. The Viennese waltz, which had a tremendous vogue in Europe and the U.S. in the 19th century, was made famous by Johann Strauss, father and son. The waltz rhythm has inspired countless compositions not intended as dances, by such composers as Carl Maria von Weber, Ravel, Brahms, Berlioz, Chopin, and Richard Strauss. See also *Dancing.*

Walvis Bay (*wạl'vĭs bā*), or WALFISH BAY (*wạl'fĭsh*), a town in western South-West Africa, on Walvis Bay, an inlet of the Atlantic Ocean, about 710 m. N. of Cape Town. The town, its harbor, and the surrounding territory (374 sq. m.) form an exclave of Cape of Good Hope Province, although they have been administered since 1922 as part of the trust territory of South-West Africa. Walvis Bay has the only good harbor on the coast of South-West Africa, and there is some trade with Great Britain, mostly in frozen foods. The town is the terminus of a railroad to the interior. Fishing and whaling are the main occupations. Population of the town, 1946, 2,270; of the territory, 2,424.

Wampanoag (*wŏm-pạ-nō'ăg*), one of the principal Algonquian Indian tribes of New England, formerly occupying the area E. of Narragansett Bay in Rhode Island and southeastern Massachusetts, including the islands of Nantucket and Martha's Vineyard. Their mark in history is mainly due to their chiefs Massasoit and his son King Philip. The first signed, and faithfully kept, a treaty of friendship with the Pilgrims, while the second led his people in the bloody two-year war (1675-76) which bears his name.

Wampum (*wŏm'pŭm*), the contracted form of the New England Algonquian name for the shell beads in use among the North American Indians. Along the Atlantic seaboard and in New England, wampum was mainly of two colors; the white and the violet or purple, the latter varying from a pale or pink violet to a dark, rich purple sometimes called black. The white was preferred for use in ritual and ceremony, while the dark was employed for public affairs, official communications, and trading purposes. The dark was much more valuable commercially. The ratio commonly was as two to one. Either loose, in strings, bundles of strings, or in belts and sashes, wampum was used as a medium of exchange among the Indians and at an early date, at fixed values both in merchandise and in dollars and cents, served a similar function for the whites. Because of extensive counterfeiting and a flood of inferior beads in the period 1640 to 1662 wampum declined rapidly in value and soon lost its standing as a form of currency.

Wanamaker (*wŏn'ȧ-mā-kẽr*), JOHN, merchant, born in Philadelphia, Pa., July 11, 1838; died near Philadelphia, Dec. 12, 1922. With his brother-in-law, Nathan Brown, he founded (1861) Wanamaker and Brown, a retail clothing store in Philadelphia; in 1869, after Brown's death, the firm was called John Wanamaker and Company, and in 1877 it became one of the first and best-known department stores. A New York branch was opened in 1896. Wanamaker founded the Bethany

JOHN WANAMAKER

Presbyterian Church, was for many years president of the Philadelphia Y.M.C.A., and made many subscriptions to aid benevolent enterprises, such as relieving yellow fever sufferers in the South and famine-stricken peasants in Ireland. President Harrison appointed him Postmaster General in 1889, a position he held for four years. He introduced the profit-sharing system into his business.

Wandering Jew (*wŏn′dẽr-ĭng jū*), the subject of several legends, a character represented as a Jew who is condemned to wander from place to place until the day of judgment. Three noteworthy legends are included in the list. The one is that of Matthew Paris, who represents him as the doorkeeper of the judgment hall, in the service of Pontius Pilate. It is related that he scorned the Lord as He was led forth, saying "Get on faster, Jesus," and the latter replied, "I am going, but thou shalt tarry till I come again." In another legend he is represented as a carpenter making the cross for Christ, and, when the latter was pressed down with the weight of His cross, the legendary character is said to have urged Him to proceed, but Jesus replied, "Truly I go away, and that quickly, but tarry thou till I come." Another legend is that he was a shoemaker at his bench and refused the Savior permission to rest on his accustomed seat. In each case the subject of the legend is represented as wandering from place to place, laden with cares and tribulations, but in vain seeking death. Doré based some of his drawings upon the Wandering Jew and the subject was chosen by Eugene Sue and other novelists and poets.

Wank (*văngk*), ROLAND ANTHONY, architect, born Oct. 2, 1898, in Budapest, Hungary. He was educated at the Royal Polytechnicum, Budapest, the Technical Univ. in Brunn, Czechoslovakia, and at the Coll. of Beaux Arts and School of Applied Arts, Budapest. Before he came to the U.S. in 1924 he was already a promising architect. He quickly established a reputation here and in 1933, when the Tennessee Valley Authority was created, he was appointed chief architect for the project. His principal achievements were the designing of the town of Norris, Tenn., and the Greenhills Resettlement Project, an Ohio community built by the Suburban Resettlement Administration. He has also been chief consulting architect for the Rural Electrification Administration.

Wapakoneta (*wä-pȧ-kō-nĕt′ȧ*), county seat of Auglaize County, Ohio, 85 m. s. of Toledo, on the Auglaize River. It is served by the New York Central and the Baltimore & Ohio R.R.'s. The city lies in a fertile agricultural region, and enjoys a thriving commerce in cheese, cereals, petroleum, and livestock. The manufactures include furniture, machinery, toys, and wooden handles. A feature is Fort Amanda, erected during the War of 1812. The town itself was not founded until 1832. Wapakoneta was built on the site of an Indian town and was incorporated in 1849. Population, 1940, 5,225; in 1950, 5,797.

Wapiti (*wŏp′ĭ-tĭ*), a species of large deer found in North America. It is closely allied to the red deer of Europe, but is considerably larger, weighing from 800 to 1,000 lbs. and measuring 5 ft. in height at the shoulders. The wapiti is commonly and erroneously called *elk* in America. See *Elk*.

War (*wạr*), an armed contest between nations or states, or between different parties in the same state. In the former case the contest is termed *international war* and is under warrant and by authority of the sovereign power of each belligerent; in the latter case it is termed *civil war*. *Aggressive* or *offensive* war is a contest which is prosecuted in the territory of the antagonist, while *defensive* war is an armed resistance to an attack.

The usual plan of conducting warfare is by annihilation or capture of troops and the seizure or destruction of territory, property, and armaments. Among savages, war begins with the invasion of the enemy's territory without formal notice. Civilized nations usually attempt to obtain a settlement of difficulties without resort to armed force. When peaceful means fail, a formal declaration of war is usually proclaimed. Most nations regard their opponents as the enemy only so long as they bear arms actively. When peace is declared friendly relations are re-established.

Plunder, tribute, territory, extension of trade, propagation of religion, acquisition of colonies, avenging of insults, redressing of wrongs, and vindication of honor have been objectives of war in all times. In recent times ideological differences have become increasingly important as causes for making war. War was regarded as natural in primitive societies and during early historical times. The narrow interests of the group were considered as sufficient justification for war. Not until classical antiquity did the need for the justification of war on grounds other than self-interest manifest itself. To justify the wars in which they engaged the Greeks and the Romans formulated the theory of the "just cause." In medieval times the Catholic Church preached the solidarity of all humanity. Wars against other Christians could be justified only when necessary to punish violators of peace. No moral justification, however, was needed to war against heretics and infidels. With the development of national states in the 15th, 16th, and 17th centuries, the ethical justification of war was again abandoned in favor of "natural law." The state was declared to be the judge of its own actions, and that *de facto* power constituted sufficient reason for making war. In the 19th century, as wars became increasingly destructive and as they involved more and more of the populations of belligerent nations, they could no longer be justified solely for reasons of state. Vindication was sought on the basis of "national honor" or "national interests" as well as the punishment of violators of international treaties. With World War I reaching new heights of destructiveness, the opposing sides sought to gain the support of the world by asserting that they were fighting for morality and for justice. The preoccupation of the world with the ethical justification for war was shown when the blame on Germany for the outbreak of World War I was written into the Treaty of Versailles in 1919. Ethical considerations also figured prominently in World War II when the Allied nations asserted that they fought for the principles of the "Four Freedoms," while the Axis powers proclaimed that they were fighting to fulfill their national destinies.

Until very recently war was recognized as a legitimate and legal means by which a country could further its political, economic, and religious interests. The manner of waging war, however, was eventually brought under international regulation. Whatever limitations were set on the conduct of war in ancient times resulted mostly from custom or tradition. During the Middle Ages the Church sought to regulate the conduct of warfare among Christians. It was not until the 16th and 17th centuries, however, that a body of international law (*q.v.*) was developed which limited the hitherto almost unbounded power of belligerents in war. Usage and custom, nevertheless, still played the major part in the regulation of the conduct of war. As warfare increased in violence during the 19th century, the laws of war were elaborated. Starting with the Declaration of Paris in 1856, a series of international treaties, outstanding among which were the Red Cross Convention (*q.v.*) of 1861, and the Hague Conventions of 1899 and 1907, sought to regulate the conduct of war. After World War I, while further efforts were made to regulate warfare, the widespread sentiment in all countries that international law should seek to prevent war led to the signing of the Kellogg-Briand Pact in Paris in 1927 by which the signatory nations renounced war as an instrument of national policy.

The Nuremberg Trials (*q.v.*) in 1945-46 of the Nazi war leaders resulted in their conviction on the charges of committing the crime of waging aggressive war and for crimes against humanity. This affirmation of principles on which the men were tried, meant that the nations of the world had relinquished their freedom to make war in order to vindicate what they themselves considered to be their rights. The trials also shifted the emphasis from punishing the state for waging aggressive warfare to punishing the individuals responsible. Hitherto international law had not been considered applicable to the individual. The charter of the U. N. (*q.v.*), which obliges its members to refrain "from the threat of use of force against the territorial integrity or political independence, or in any other manner inconsistent with the purposes of the United Nations," was an important milestone on the road to outlawing war. See also *Army*.

War, DEPARTMENT OF, now Department of the Army. See also *Army, U.S.; United States, Departments of the.*

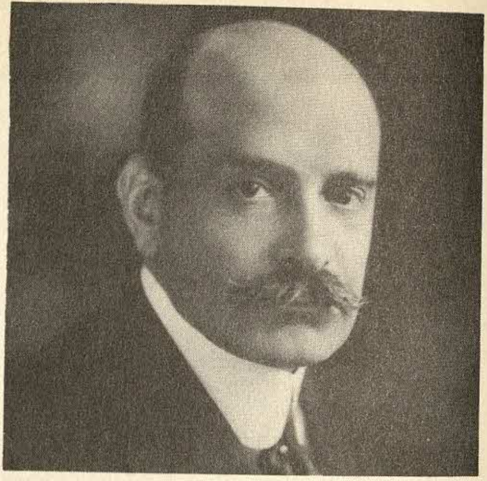
War and Peace (*wạr and pēs*), one of the world's greatest novels by the Russian writer, Leo N. Tolstoy, written during the years 1865-72. It mirrors in a grandiose way the time of Napoleon's invasion of Russia (1812). It was adapted for the stage (1942) by Alfred Neumann, Erwin Piscator, Harold L. Anderson and Maurice Kurtz and performed in New York City.

Warbeck (*wạr′bĕk*), PERKIN, pretender to the English throne, born at Tournay, England, in 1474; executed Nov. 23, 1499. In 1490 he appeared at the court of Burgundy, where he impressed all who met him with his extraordinary resemblance to Edward IV. While there he was instructed by tutors to represent Richard, Duke of York, the younger of the two princes who are supposed to have been murdered in the Tower in 1483. The opponents of Henry VII supported him and he received encouragement from foreign powers which were hostile to England. In 1497 he made an expedition into England and was captured and confined in the Tower, where he was allowed considerable liberty, but he afterward entered into a conspiracy against the government and was executed.

Warblers (*wạr′blẽrz*), the name applied to a family of perching birds, most of which are shy, small, and active. They have a clear and beautiful song. The common birds of this family include the *redbreast, hedge sparrow, redstart, nightingale, bluebird, sedge warbler,* and *reed warbler.* Most warblers are migratory and are widely distributed in all climes. They are valuable because of their activity in catching large numbers of insects, which form their chief food. The *wagtail* is a notable species of the warbler family and is so called from the habit of wagging the tail, when it is on the ground. It is seen mostly in pastures and meadow lands and includes several species, such as the gray wagtail, yellow wagtail, and pied wagtail. Reed warblers and sedge warblers are found mostly in marshy places, where they build nests in the reeds, usually hanging them among four or five of the larger plants by means of threads of wool or soft grasses. The family of birds called *Sylviidae,* confined to the Old World, includes several typical warblers and the tanager family embraces many American species.

Warburg (*vär′bŏŏrk*), OTTO HEINRICH, physiologist, born in Germany in 1883. He was educated at Berlin and Heidelberg Univs. and later became professor at Berlin Univ. and director of the Kaiser Wilhelm Institute for Biology. He won the Nobel Prize for physiology and medicine (1931) for his discovery of the character and mode of action of the respiratory ferment. He is also known for his research on the respiration of living cells and on cancer.

Warburg (*wạr′bûrg*), PAUL MORITZ, banker, born at Hamburg, Germany, in 1868; died in New York, Jan. 24, 1932. After graduating in 1886, he worked in banking houses in London and Paris. In 1894, he entered his father's Hamburg banking firm, M.M. Warburg & Co. In 1895, he married Nina J. Loeb, and moved to New York City in 1902, later becoming an American citizen. He joined the firm of Kuhn, Loeb & Co., became director of various banks and business interests, and after the 1907 panic he urged reforms in the American banking system. Although his plan for a centralized banking system was rejected, some of his ideas are said to have been incorporated in the Federal Reserve Law of 1913. Although one of the five men appointed to the first Federal Reserve Board by President Wilson in 1914, he refused to be considered for a second term in 1918 because of the possibility that the public might object to his German birth. However, he was an active member of several committees devoted to war work. From 1921-26 he served on the advisory council of the Federal Reserve Board. He organized and was chairman of the International Acceptance Bank, and also chairman of the Manhattan Co. Foreseeing the Wall Street crash of October 1929, he warned against the wave of speculation that preceded it. He contributed to several magazines of opinion, wrote two books on banking, and helped to support various cultural and philanthropic projects.



Photograph by Fabian Bachrach

PAUL M. WARBURG

Ward (*wạrd*), ARTEMAS, soldier and jurist, born in Shrewsbury, Mass., Nov. 27, 1727; died there Oct. 26, 1800. In 1748 he was graduated from Harvard, served as lieutenant colonel in the French and Indian wars, and was a prominent member of the Massachusetts legislature. He was made commander-in-chief of the Massachusetts troops, in 1775, and commanded at the siege of Boston until the arrival of Washington, when he became second in command. In 1776 he resigned on account of ill health and in the same year became president of the Massachusetts executive council. He served as a member of the Massachusetts state legislature for 16 years and was a Federalist Representative in Congress from 1791 to 1795.

Ward, ARTEMUS. See *Artemus Ward.*

Ward, FREDERICK TOWNSEND, American adventurer and military leader in China, born at Salem, Mass., in 1831; died in China, Sept. 21, 1862. The son of a shipbroker, he was educated entirely at home except for two years at Norwich Univ., Norwich, Vt. At 17 he went to sea and spent the next 12 years either as a sailor or in military service, fighting in Nicaragua and the Crimea, among other places. In 1859 he signed on a Yangtze River steamer at Shanghai, China, and at about the same time married the daughter of a Chinese merchant. When Chinese insurgents, called "Taipings" by the foreigners, threatened the coastal provinces around Shanghai in 1860, he was hired by Chinese officials and business leaders to head an army of foreign adventurers to suppress the rebellion. He succeeded in recapturing Sungkiang, which had been seized by the rebels, but failed to take back Tsingpu, another insurgent stronghold. His forces were reorganized to include only Chinese soldiers under foreign officers. The British and other consuls objected, and he was arrested, but escaped. Early in 1862 he raised a new force, the "Ever Victorious Army," which he led in several campaigns near Shanghai and Ning-po. He was fatally wounded during an attack on Tzeki, and was given a state funeral in Sungkiang. A memorial temple was erected in his honor. Subsequently, the task of putting down the Taiping Rebellion was completed by Charles George ("Chinese") Gordon.

Ward, HENRY AUGUSTUS, naturalist, born in Rochester, N.Y., Mar. 9, 1834; died July 4, 1906. He studied at Middlebury Acad. and Williams Coll. In 1854 he was assistant to Louis Agassiz at the Lawrence Scientific School of Harvard Univ. Subsequently he studied in Paris and traveled through Europe and the Orient. He returned to the U.S. in 1860 and was made professor of natural science at Rochester Univ., serving until 1865, when he became manager of gold mines in Montana. In 1871 he was naturalist to the U.S. commission in Santo Domingo. Subsequently he devoted much time to making large and valuable collections of mineralogy and geology, specimens of which were distributed to universities in America and Europe. He published "Description of the Most Celebrated Fossil Animals in the Royal Museums of Europe" and "Notices of the Megatherium Cuvieri."

Ward, JOHN QUINCY ADAMS, sculptor, born in Urbana, O., June 29, 1830; died May 1, 1910. He went to Washington in 1857, where he studied sculpture, and later modeled busts of Hannibal Hamlin, Alexander H. Stephens, and others. In 1861 he settled in New York City. To find a superior model for his bronze cast, "Indian Hunter," he visited the western frontier to study Indian life. He went to Europe in 1872 and again in 1878, and served as president of the National Acad. of Design. Among his best-known works are statues of Gen. Lafayette, in Burlington, Vt.; James A. Garfield, in Washington, D.C.; Israel Putnam, in Hartford, Conn.; Roscoe Conkling, in Madison Square; Shakespeare, in Central Park; and Washington, in Wall Street, the last three named being in New York City. Other productions include: "The Good Samaritan," "The 7th Regiment Monument," "The Pilgrim," and statues of Henry Ward Beecher, Commodore Perry, and Gen. Thomas.

Ward, LESTER FRANK, geoglogist and sociologist, born at Joliet, Ill., June 18, 1841; died Apr. 19, 1913. He studied in his native state and at the Columbian Univ., Washington, D.C. Subsequently he studied law, worked seven years in the U.S. Treasury Department, and was for some time assistant geologist under the government geological survey. His "Dynamic Sociology" outlines a system of cosmic philosophy which harmonizes with, although it modifies, the theories of Herbert Spencer (*q.v.*). Other works include: "Outlines of Sociology," "Types of the Laramie Flora," and "Geographical Distribution of Fossil Plants."

Ward, MARY AUGUSTA ARNOLD (MRS. HUMPHRY WARD), novelist, born on the island of Tasmania, June 11, 1851; died in London, England, March 24, 1920. She was a granddaughter of Thomas Arnold and a niece of Matthew Arnold (*qq.v.*). Her father was working in Tasmania when she was born, but the family returned to England in 1856. In 1872 she married THOMAS HUMPHRY WARD (1845-1926), who was the editor of such works as "English Poets" and "Men of the Time." Mrs. Ward began her literary work by writing criticisms for *Macmillan's Magazine* and contributions to *Smith's Dictionary of Christian Biography*. A story entitled "Miss Bretherton" appeared in 1884, and she thereafter published a number of novels. "Robert Elsmere" is her most successful work. It has been translated into many languages.

Ware (*wâr*), a town in Hampshire County, Massachusetts, on the Ware River, 68 m. w. of Boston. It is on the Boston & Albany and the Boston & Maine R.R.'s. Among the manufactures are hardware, machinery, paper products, shoes, and clothing. The area was settled in 1673, but the town was not founded until 1717; it was incorporated in 1775. The town meeting is still Ware's form of government. Population, 1950, 6,217.

War Fever (*wa̤r fēv′ẽr*). See *Typhus.*

War Manpower Commission (*wa̤r măn′pou-ẽr kŏm-ĭsh′ŭn*), a U.S. government agency, established on April 18, 1942, within the Office of Emergency Management to mobilize manpower to meet requirements of various government agencies, *i.e.,* the War and Navy Departments, Selective Service System, War Production Board, Civil Service Commission, Department of Labor, Maritime Commission, and War Food Administration. The War Manpower Commission was composed of heads of agencies concerned. All state employment service systems were Federalized in January 1942 and were integrated into the U.S. Employment Service which, from July 1942, was the operating arm of the War Manpower Commission. When the War Manpower Commission was dissolved in September 1945, the U.S. Employment Service was transferred to the Department of Labor. Administration of state and local U.S. Employment Service offices reverted to the 48 states and the territories of Alaska and Hawaii on Nov. 16, 1946. Local offices in the District of Columbia and in Puerto Rico remain under jurisdiction of the U.S. Employment Service and the Department of Labor. In 4 years and 10 months of Federal administration the U.S. Employment Service made more than 50,000,000 placements in war production establishments and in reconverted peacetime plants. Under an act passed by Congress and signed by President Truman on July 26, 1946, returning employment services to state administration, the Federal government financed operations 100 per cent. In the original Wagner-Peyser Act (National Employment Service Act) of 1933, establishing systems in every state, financing was on a 50-50 matching basis by state and Federal governments.

Warm-Blooded Animals (*wôrm′-blŭd′ẹd*), birds and mammals (*qq.v.*) which usually sustain a high constant temperature, generally above that of the surrounding atmosphere. Some exceptions have a high and constant temperature in summer, but hibernate in winter when their temperature becomes lower to a degree dependent on the environment. The higher its average heat the less able is the animal to stand a low temperature. A drop of 30° F. will cause dangerous or fatal changes in most birds, for instance. The average temperature of a horse is 99-100° F.; of an ox, 100-101° F.; of a cow, 101-102° F.; of a dog, 100-101° F.; of a man, 98.6° F.

Warm Springs (*wôrm sprĭngz*), a town in Meriwether County, Georgia, 60 m. s.w. of Atlanta, on the Atlantic Coast Line and Southern R.R.'s. Located in a mountainous region, it is noted for the medicinal value of its warm springs, especially in the treatment of infantile paralysis. The Warm Springs Foundation (*q.v.*) is located here, and Franklin D. Roosevelt, a frequent visitor, maintained a cottage known as "The Little White House" here. This was the place of his death. Warm Springs was a resort in the 1830's, but burned in 1865 and was not incorporated until 1924. Population, 1950, 557.

Warm Springs Foundation (*wôrm sprĭngz foun-dā′shŭn*), a medical institution for the study and treatment of the after-effects of infantile paralysis. Located in Warm Springs, Ga., the foundation was organized in 1927 under the guidance of Franklin D. Roosevelt (*q.v.*). The purpose of this nonstock, nonprofit organization is twofold: (1) to provide complete medical, surgical, and physical therapy services for infantile-paralysis patients; and (2) to provide instruction and training to the medical, nursing, and physical therapy professions in the present-day methods of treatment of this disease. Patients are admitted, after a complete medical case history and examination, according to three financial classifications: pay, part aid, or full aid. There is great variance as to age, treatment, length of stay at the hospital, etc. Over 500 patients are treated at the foundation annually, while the average daily number of patients in residence throughout the year is about 90. Some of the treatments used include swimming and physical therapy.

Warner (*wạr′nẽr*), CHARLES DUDLEY, author, born in Plainfield, Mass., Sept. 12, 1829; died in Hartford, Conn., Oct. 20, 1900. He was graduated from Hamilton Coll. in 1851, studied law at the Univ. of Pennsylvania, and in 1854 began the practice of law in Chicago. In 1860 he moved to Hartford, Conn., to become associate editor of the Hartford *Press* with his college classmate, Joseph R. Hawley. This publication was merged with the Hartford *Courant* in 1867.

Warner was deeply interested in prison reform, and lectured on educational and literary topics. His largest work is entitled "Library of the World's Best Literature," which he edited with the assistance of a number of writers; it was published in 30 volumes in 1895. "That Fortune," a novel, was his last work. Other writings include "Being a Boy," "My Winter on the Nile Among the Mummies and Moslems," "Captain John Smith," "Relation of Life to Literature," "In the Wilderness," "Washington Irving," "Roundabout Journey," "Backlog Stories," and "People for Whom Shakespeare Wrote." "Our Italy," a description of southern California, was published in 1891. He collaborated with Samuel L. Clemens (Mark Twain) in writing "The Gilded Age."

Warner, SETH, soldier, born in Roxbury, Conn., May 17, 1743; died there Dec. 26, 1784. He settled in Bennington, Vt., in 1765. At that time the region was in the *New Hampshire Grants*. In the disputes between the settlers and New York, Warner was one of the leaders. In the Revolution he was second in command at the capture of Ticonderoga, when that place was taken by Ethan Allen. On the following day he captured Crown Point, for which he was made a colonel by Congress. He participated with Montgomery in the Canada campaign, took part in the Battle of Bennington, and continued in the service until compelled by ill health to resign, in 1782. OLIN LEVI WARNER (1844-96), the sculptor, was his great-grandnephew. Among his chief works are "Twilight," "Diana," "May," and "The Dancing Nymph."

Warner, SUSAN (pen name, ELIZABETH WETHERELL), novelist, born in New York City, July 11, 1819; died in Highland Falls, N.Y., March 17, 1885. Her first two novels, "The Wide, Wide World" (1850) and "Queechy" (1852), achieved enormous popularity. Her books were typical of the later 19th century—pious, moral histories of young people, written with considerable charm.

War of Devolution (*dĕv-ô-lū′shŭn*). See *Devolution, War of.*

War of 1812, the name of an armed conflict between Great Britain and the U.S., sometimes called, in the latter country, the Second War of Independence. The causes which led up to this war may be traced back to the attitude assumed by Great Britain, immediately after the Revolutionary War, toward the new republic, especially in relation to American foreign trade.

Great Britain held to the view, "once an Englishman always an Englishman," and maintained the right to interfere with American vessels on the high seas and search for seamen claimed to be British subjects, who were taken from them and impressed to serve in the British navy. Several men-of-war were fired upon and compelled to give up seamen in their crew, and those who refused to serve were imprisoned. In addition to claiming the right of imprisonment, England issued orders to interfere with American commerce by prohibiting trade by any neutral vessels with the dependencies of any nation with whom she was at war. This greatly interfered with American trade, since France and England were engaged in a war at that time. In 1807 Napoleon had issued the Milan Decree, forbidding commerce of any nation with England or her colonies, and it appeared that the U.S. would become involved with both countries. However, the proximity of Canada and the desire of France to retain the friendship of America caused Napoleon to revoke his decree, in 1810, and commercial intercourse between the two countries was resumed.

James Madison had in the meantime been elected President as the candidate of the (Democratic-) Republican party. He did not favor warlike measures, but his party advocated an aggressive policy against Great Britain. It was said of the President that he "could not be kicked into a war," but the Congress that assembled in December 1811 passed acts to increase the army and navy and made large appropriations for offensive action. The President finally declared war against Great Britain, on June 18, 1812. This was followed five days later by Britain's withdrawal of the "Orders in Council," which had established a blockade of European ports and thus excluded American commerce to a large extent. The U.S. was not prepared for war, having made little headway in building up means of offense and defense, while Great Britain was then at war with France and, therefore, was ready to take decisive action.

An American invasion of Canada was the first act of open hostility, but the enterprise proved signally unsuccessful. Gen. Hull, governor of Michigan Territory, at the head of 2,000 men, was operating against the hostile Indians in the Northwest when war was proclaimed. He had been invested with power to invade Canada and on July 12 crossed the Detroit River with the object of capturing the British post at Walden. Gen. Brock captured a detachment sent out to guard the provisions coming to the American camp and Hull decided to retreat to Detroit without striking a blow. The British were reinforced by a force of Indians under Tecumseh and proceeded to attack Detroit. Gen. Hull, without offering to make resistance, surrendered the fort, with its garrison and stores, to the British on Aug. 16. He was afterward convicted on charges of cowardice and sentenced to be shot, but the President pardoned him in view of his previous services. The second attempt to invade Canada was undertaken by Gen. Van Rensselaer with a force of militia, principally from New York. On Oct. 13 he crossed the Niagara River with a part of his troops and made an attack on Queenston Heights. After gaining possession of the British battery, the Americans were compelled to retreat, having lost many of their men. In this battle British Gen. Brock was mortally wounded.

The Americans were more successful in their naval engagements during the first year of the war. Capt. Isaac Hull on Aug. 19, with the frigate *Constitution,* overtook and disabled the British vessel *Guerriere* off the coast of Massachusetts, and the latter vessel was blown up the following day. On Oct. 18 the American vessel *Wasp* captured the *Frolic,* but the British gun ship *Poictiers* later captured the *Wasp.* In the same month Com. Decatur, commander of the frigate *United States,* captured the British *Macedonian.* Capt. Porter, the following month, with the *Essex,* pursued the British packet *Nocton* and captured it and its cargo, which included $55,000 in specie. In the same month Com. Bainbridge, with the *Constitution,* destroyed the British vessel *Java* and took its crew prisoners.

The Americans undertook a third invasion of Canada at the beginning of 1813. Gen. Dearborn, at the head of 1,700 men, captured York, but was soon recalled and superseded by Gen. Wilkinson, who was joined by a force under Gen. Hampton and the two made a combined attack upon Montreal. The object sought was not attained, but the two armies wintered in Canada. In May the British invaded the State of New York, but they were defeated at Sackett's Harbor. Gen. Harrison built Ft. Meigs, on the Maumee, where he was besieged by a force of British and Indians under Proctor, but large numbers of the Indians deserted, and the British abandoned the siege and retreated to Malden. In the meantime Com. Perry undertook to get control of Lake Erie, which was commanded by a British squadron of six vessels under Com. Barclay. In September he made an attack upon the British near Put-in Bay, where he won a complete victory. This destruction of the most important British fleet upon the Great Lakes enabled the Americans under Gen. Harrison to undertake a fourth invasion of Canada. He pursued the British under Proctor until they took a stand on the Thames River, where they were defeated after a pitched battle on Oct. 5. Gen. Jackson was sent with a force of Americans into Alabama, where the Creeks had taken up arms, and they were com-

WAR OF 1812. GENERAL MACOMB AT THE BATTLE OF PLATTSBURG

pletely defeated at Horseshoe Bend in January 1814. After the battle of the Thames, Gen. Harrison was transferred to Buffalo, where he resigned. The year 1813 closed without decisive results, except that Capt. Lawrence, who had been made commander of the *Chesapeake,* was defeated and slain in an engagement with the British vessel *Shannon,* commanded by Capt. Broke.

Another invasion of Canada was undertaken in the spring of 1814. Three thousand Americans under Gens. Scott and Ripley crossed the Niagara early in July and soon captured Ft. Erie. They were met by the British under Gen. Rial near the Chippewa River, where they won a victory, and the British retreated to Burlington Heights. The Battle of Lundy's Lane, the hardest fought engagement of the war, occurred on July 25. Each side lost about 800 men and neither gained material advantages, but the Americans withdrew to Ft. Erie, where they were besieged until September, when the British works were carried. The British under Gen. Drummond retreated to Ft. George, while the Americans went into quarters at Black Rock and Buffalo. In September 1814, the British under Gen. Prevost invaded New York by way of Lake Champlain. His fleet was defeated near Plattsburg and the land forces were repulsed about the same time. However, the British ascended Chesapeake Bay, defeated the Americans at Bladensburg, and captured the city of Washington, where the government buildings were sacked. Many people of New England were opposed to the war and sent delegates to a convention at Hartford, Conn., where they published an address after a secret session of three weeks.

Spain sympathized with Great Britain during the War of 1812, and the British were permitted to fit out an expedition at Pensacola, in Florida, then a Spanish possession. Gen. Jackson proceeded against that point and expelled the British from Florida. Having learned that the British were landing at New Orleans and preparing to conquer Louisiana, he proceeded to undertake to drive them out, supported by 2,000 Tennessee riflemen. Four miles below the city, at Chalmette, he took a strong position. The British were under the command of Gen. Pakenham, who had arrived with reinforcements and taken command of the British troops. Several attacks were made at different times, but the final battle occurred on Jan. 8, 1815, when the British were defeated with heavy losses, including Gens. Pakenham and Gibbs. This battle was fought two weeks after peace had been concluded, but, because of slow transportation at the time, this was unknown to the contending parties at New Orleans. The war ended with the Treaty of Ghent, in Belgium, and both countries received the news with deep satisfaction. No mention was made of the issues that brought on the war. The treaty was devoted chiefly to the settlement of unimportant boundaries and the possession of small islands in Passamaquoddy Bay.

War of Jenkins' Ear (*wạr of jĕng'kĭnz ēr*), the popular name for a war between England and Spain, waged in 1739. This war resulted from a Spanish attack, in 1731, upon Robert Jenkins, master of an English brig returning from the West Indies. Jenkins claimed that the Spaniards had boarded his vessel and cut off one of his ears. Before the declaration of war, in 1739, Jenkins reported the incident before the English House of Commons. The War of Jenkins' Ear served as a prelude to King George's War (1744-48), the War of the Austrian Succession (1740-47), and the Seven Years' War (1756-63).

Warrant (*wŏr'ạnt*), in law, a writ which gives an officer an authority over the persons or property of others. The term is more frequently applied to writs for the arrest of persons, which may be issued by a justice of the peace or under the order of a higher court or the grand jury. A *search warrant* gives authority to an officer to search private premises for specified goods or property belonging to another. The term *bench warrant* is applied to an order issued by a judge for the arrest of a person.

Warrant Officer (*wŏr′ạnt ôf′ĭ-sẽr*), in the U.S. Army, an officer having administrative duties only, but who is not counted among noncommissioned officers. See also *Noncommissioned Officer; Officer.*

Warranty (*wŏr′ạn-tȳ*), in law, a term used in distinct connections, especially to indicate a covenant on the part of the grantor in the transference of title to real property. An instrument of this kind is called a *warranty deed*. The term applies in insurance to indicate an undertaking on the part of the insured that certain alleged facts are as he represents them to be. In the sale of personal property the term warranty indicates that the seller guarantees the title or the quality of the property sold. Such warranties may be either expressed or implied.

War Relocation Authority (*wạr rê-lô-ḳā′-shŭn a̤-thŏr′ĭ-tȳ*), a Federal agency established during World War II (March 18, 1942-June 30, 1946), and charged with the responsibility for supervising the relocation of persons of Japanese ancestry who were evacuated from designated areas in California, Oregon, Washington, and Arizona, in accordance with military orders, and settled in ten relocation centers operated by the Authority in the West. In December 1944 the War Dept. revoked the general exclusion order, and the evacuees were permitted to return to West Coast states. In March 1946 the relocation centers were closed. The Authority was also responsible for the administration of the Emergency Refugee Shelter, Ft. Ontario, N.Y., which housed European refugees, 1944-46.

Warren (*wŏr′ĕn*), county seat of Trumbull County, Ohio, on the Mahoning River, 13 m. N.W. of Youngstown. It is on the Erie, the Pennsylvania, and the Baltimore and Ohio R.R.'s. Warren is surrounded by a rich farming and dairying country which contains deposits of bituminous coal, iron ore, petroleum, and building stone. The manufactures are primarily steel, steel and metal products, and those of allied industries. The place was settled in 1799 and incorporated as a village in 1834 and as a city in 1869. Population, 1950, 49,856.

Warren, a borough and county seat of Warren County, Pennsylvania, on the Allegheny River, S. of Jamestown, N.Y. It is served by the Pennsylvania and New York Central R.R.'s. Situated in the oil region of Pennsylvania, it is the gateway to the Allegheny National Forest. Within easy reach of the city are extensive hunting, camping, and fishing grounds. Among the manufactures are metal products, furniture, lumbering equipment, refined oil, gasoline, and lubricants. It was settled in 1795 and incorporated in 1832. Population, 1940, 14,891; in 1950, 14,849.

Warren, a town in Bristol County, Rhode Island, *ca.* 10 m. S.E. of Providence. It is situated on Narragansett Bay and on the New York, New Haven & Hartford R.R. In addition to oyster and shellfish industries, it has manufactures of cotton goods and automotive equipment. Settled in 1632 as part of Swansea, Mass., it was annexed by Rhode Island and incorporated as a town in 1747. It was the seat of Rhode Island Coll., now Brown Univ. (*q.v.*) from 1765 to 1770. Population, 1950, 8,513.

Warren, EARL, Chief Justice of the U.S., born in Los Angeles, Calif., March 19, 1891. Graduated from the Univ. of California law school (1912), he was admitted to the bar in 1914. He then practiced law in Oakland until World War I, during which he served in the Army. After the war, he entered local politics; he was deputy city attorney for Alameda County (1920-23) and district attorney (1925-39). Widely respected for his stand against racketeering, he was attorney general of California (1939-43) and was elected governor of that state in 1942.

Although a Republican, Warren's reform politics made him popular with the liberal wings of both the Republican and Democratic parties, and in the 1946 gubernatorial campaign he won the nomination of both parties. Nominated for the Vice Presidency in 1948, he was the running-mate of Thomas E. Dewey (*q.v.*) on the Republican ticket, but failed to be elected. In 1952 Warren

EARL WARREN

was himself a candidate for the Presidential nomination. Elected governor for a third term in 1950, he resigned in 1953, when he was appointed 13th Chief Justice of the U.S. Supreme Court. Not long after, on May 17, 1954, Chief Justice Warren handed down one of the high court's most significant decisions, outlawing segregation in the nation's public schools.

Warren, GOUVERNEUR KEMBLE, soldier, born at Cold Spring, N.Y., Jan. 8, 1830; died at Newport, R.I., Aug. 8, 1882. He was graduated from West Point in 1850 and served with the corps of topographical engineers in the Western states for several years. He taught mathematics at West Point (1859-61) and became colonel of volunteers at the beginning of the Civil War. For gallant service at Gaines's Mill, Second Bull Run, and Antietam, he was made a brigadier general in 1862. Afterward he distinguished himself at Fredericksburg, Gettysburg, the Wilderness, and at the siege of Petersburg. In 1865 he was made major general in the regular army and as major of engineers had charge of surveys and harbor improvements.

Warren, JOSEPH, physician and soldier, born in Roxbury, Mass., June 11, 1741; killed in the Battle of Bunker Hill, June 17, 1775. He was graduated from Harvard Univ. in 1759 and, after studying medicine, settled in Boston to practice his profession. Immediately after the Boston Massacre (*q.v.*), he was made one of the Committee of Safety and in 1774 was president of the Provincial Congress of Massachusetts. That body made him a major general, but he preferred to fight as a volunteer. He took part in the Battle of Bunker Hill, in which he was killed.

JOSEPH WARREN

Warren, WHITNEY, architect, born in New York City, Jan. 29, 1864; died there, Jan. 24, 1943. After studying at the École des Beaux Arts, Paris, he established himself in New York in 1894. His first major architectural assignment was designing the New York Yacht Club building, completed in 1899. He became associated with Charles D. Wetmore, established the firm of Warren & Wetmore, and was a co-designer with Wetmore of New York's Grand Central Station, the Vanderbilt, the Biltmore, the Commodore, and the Belmont Hotels, in New York City. In 1920 Warren was chosen architect of the Library of Louvain Univ., Belgium, which had been destroyed by the Germans in 1914. He was a member of the National Institute of Arts and Letters.

Warrensburg (*wŏr′ĕnz-bûrg*), a town in central Missouri, seat of Johnson County, 53 m. S.E. of Kansas City, served by the Missouri Pacific R.R. It is the seat of Central Missouri State Coll. Nearby are mineral springs, and Knob Noster State Park is *ca.* 10 m. E. of the town. An agricultural center in a stock-raising and dairying region, it produces shoes, uniforms, and electrical goods. Warrensburg was settled in 1845 and incorporated in 1856. Population, 1950, 6,857; in 1960, 9,689.

Warsaw (*wạr′sạ*), the capital of Poland and of the province of Warsaw, on the Vistula River, 325 m. E. of Berlin. It is a converging center in the railroad network of Central Europe (it has four railroad stations) and has an inland port at Zeran and an airport at Okecie. In addition to being the transportation center of Poland, it is the political, commercial, and intellectual capital. Its principal industry is metal working; its chief manufactures, electrical appliances, light bulbs, machine tools, precision instruments, tractors, and cars. Printing and publishing are important.

Warsaw, once considered one of the most beautiful cities of Europe, was almost completely destroyed by the Germans during World War II. It is estimated that more than 80 per cent of the buildings and monuments were demolished during the German occupation (1939-45). Since 1945 a massive reconstruction program has been in progress, and large portions of the city have been completely rebuilt or, particularly in the case of historic buildings and monuments, reconstructed. The city is now planned around two traffic axes. One links the western part of Warsaw with Praga, the industrial section on the east bank of the Vistula, and passes through a tunnel under the razed old city (Stare Miasto). The north-south axis connects the suburbs of Zolibórz and Mokotów. New construction includes the Seym (Parliament) building, the Palace of Culture and Science, the Tenth Anniversary Stadium, and many housing developments and industrial structures. Many of the palaces, churches, and monuments were reconstructed, as well as the Mariensztat, an 18th-century residential district, and the Saxon Gardens. Of the many beautiful palaces dating from the 18th century, the best known are the Potocki, Czartoryski, Raczynski (now housing the Polish Acad. of Arts) and the Staszic (home of the Polish Acad. of Sciences). Warsaw Univ., founded in 1816 and closed and reopened many times since then, was last reopened in 1945.

Warsaw probably grew up around a castle built in the 13th century or earlier by a duke of Mazovia, and in the 15th century it became the capital of Mazovia. After the fire of Krákow (Cracow) in 1595, Warsaw replaced that city as the capital of Poland. Throughout the 17th century, the Swedes contended for its possession: Charles X captured it twice (1655 and 1656), and Charles XII occupied it in 1702. The Russians captured it in 1764 and 1794. It was in Prussian hands from 1795 to 1806, when Napoleon took it and made it the capital of the grand duchy of Warsaw the next year. Taken in 1813 by Russia and awarded to that country in 1815 by the Congress of Vienna, it remained under Russian control until 1915. During the century of Russian domination, Warsaw was the scene of many insurrections (notably in 1830, 1863, and 1905). Warsaw was taken by the Germans in 1915, retaken by the Poles in 1918, and became the capital of the Polish republic after World War I.

The opening drive of World War II was aimed at Warsaw, which was taken by the Germans on Sept. 27, 1939, after three weeks of siege. In October 1940 the Germans established a Jewish ghetto in the old city district and isolated the Jewish population (*ca.* 500,000). In reprisal for a Jewish armed uprising in the spring of 1943, the Nazis completely razed the ghetto and killed most of the 40,000 survivors. As a result of the mass assassination, starvation, and forced transportation of workers to Germany, the population of Warsaw, which was more than 1,000,000 in 1939, was 22,000 at the end of the war. The Polish underground made an abortive 63-day attempt to free themselves late in 1944 (the "Warsaw Uprising"), and on Jan. 17, 1945, the city was liberated by the Red Army. Population, 1951, 760,000; 1958, 1,096,000 (including the suburbs absorbed in 1951).

Warship (*wạr′shĭp*), any government vessel designed and equipped for combatant service. A warship design represents a compromise balancing of offensive and defensive characteristics, such as armament, armor, speed, and range. There are six major combatant designs:

AIRCRAFT CARRIER, spearhead of naval striking power, a vessel designed to carry aircraft and fitted with a flight deck from which wheel-mounted aircraft may take off and return. The carrier was, in World War II, the most powerful unit of a fleet.

BATTLESHIP, one-time backbone of the fleet, a naval vessel having a large displacement, relatively high speed, long range, maximum big-gun armament, maximum protection against gunfire, bombs, and torpedoes, and ability to keep at sea in all weather. In World War II, battleships provided support for landing operations, as well as antiaircraft defense for fast carrier task forces.

Official United Nations Photo

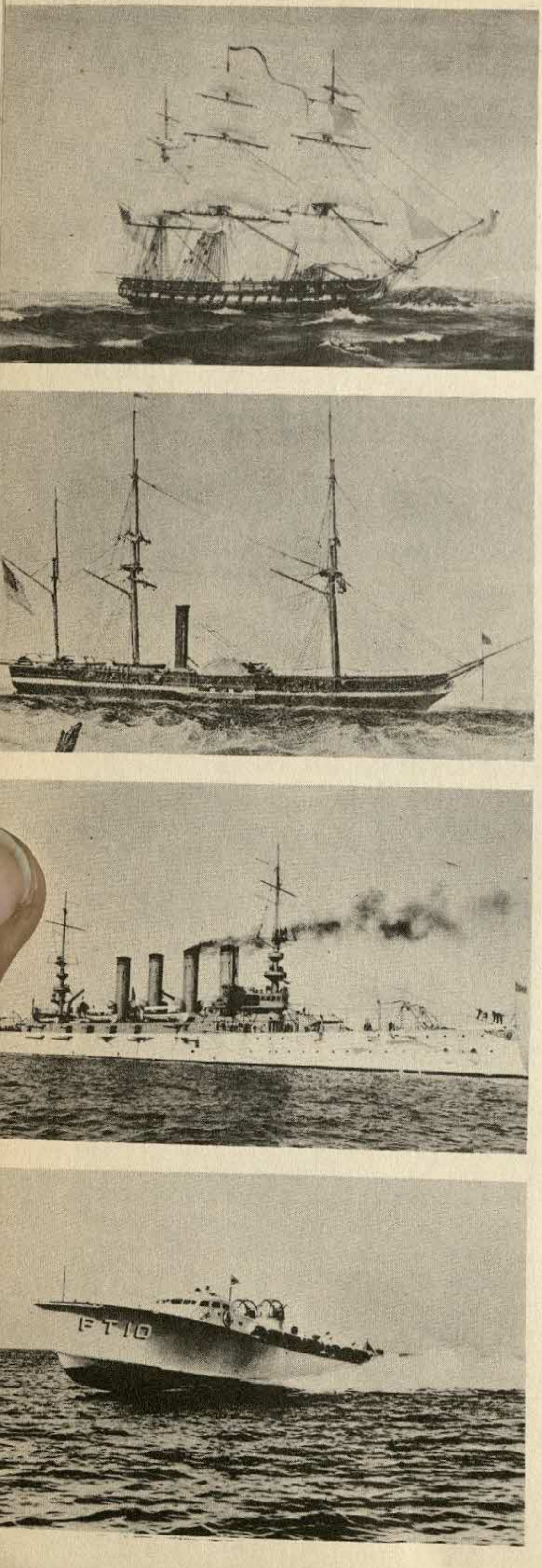
WARSAW

Section of the old city with the Cathedral towers in the background

BATTLE CRUISER, a naval vessel having high speed, wide radius of action, large-caliber guns, and moderate protection; often defined as a ship with cruiser speed and battleship armament, *i.e.,* more powerful than cruisers but no match for battleships. In World War II, battle cruisers performed a variety of missions, including commerce raiding, small force operations, beach-head support, and fleet antiaircraft support.

CRUISER, a high-speed vessel of long range in which protection against gunfire, bombs, or torpedoes is subordinated to speed and range. *Light* and *heavy* cruisers were originally so designated in accordance with the caliber of the guns carried. When treaty limitations were removed, however, the heavy cruiser increased in displacement over the light cruiser. In World War II, cruisers performed a variety of missions, including antiaircraft and beach-head support, small-force operations, and convoy escort. Cruisers have many antiaircraft guns for protection from enemy planes as well as large caliber guns for ship and shore bombardment.

DESTROYER, a naval vessel of small displacement, limited range, and high speed. Destroyers are armed with light, rapid-fire, dual-purpose guns and deck torpedo tubes, and usually carry antisubmarine weapons. In World War II, destroyers were used as surface and antiaircraft screen for



capital ships, as well as for convoy and scouting work. Later designs (in all navies) increased the range and fire power of destroyers, with the result that vessels such as destroyer escorts, corvettes, or frigates were designed primarily for the convoy escort missions usually assigned to destroyers.

SUBMARINE, a vessel designed for service both below and on the surface of the water. Torpedoes, their main armament, can be fired either above or below the surface. For action against light-armed craft or for antiaircraft protection, they usually carry one or more small-caliber guns. World War II saw the end of the submarine as a surface vessel designed for auxiliary subsurface operations. Late in the war, Germany designed what has been termed the first real submarine—a vessel designed primarily for subsurface operation, but which could operate (although at decreased efficiency) on the surface. Modern submarine design has incorporated these German-invented modifications.

ARMORED HULLS ON WARSHIPS. From earliest times the competition between offensive and defensive power has been exemplified in the construction of warships. With the advent of smoothbore cannon firing spherical shells propelled by black powder it was possible, by thickening and strengthening the hull structures, to build into wooden ships a considerable power of survival in all but the most heavily fought engagements. The frigate *Constitution* in the War of 1812 was called *"Old Ironsides"* because the enemy's shot were said to have bounced harmlessly off her oaken hull.

After the original cannon, no radical improvements in armament or defensive arrangements took place for several centuries until the middle of the 19th century. During this period rifled cannon of increased power and accuracy appeared, requiring development of better protection. The heavily armed and armored *Monitor* and *Merrimac* fought their historic encounter (1862), which demonstrated that wooden ships were obsolete. An interesting improvisation occurred (1864) in the sea battle off the Azores in which the elusive Confederate commerce raider *Alabama* was defeated by the Union ship *Kearsarge*. The latter hung chain cable over the sides to protect her vital machinery and was accused by the *Alabama* of unsportsmanlike conduct. Union gunboats in the Mississippi River were protected by metal plates, and for this reason were

Photos courtesy U. S. Navy Department

U. S. WARSHIPS

(left, from top to bottom)

U.S.S. *Constitution*, frigate, 1797; U.S.S. *Mississippi*, steam frigate, 1842; U.S.S. *San Diego*, armored cruiser, 1914; PT (patrol torpedo) Boat of World War II termed accurately and picturesquely, "ironclads."

Shortly before the turn of the 20th century, the discovery and adaptation of smokeless powder tremendously increased the power and capabilities of guns. Defensive developments to withstand this improved weapon, measures to improve underwater defense against torpedo and mine attack, and armor better disposed to defeat bombing attack led progressively to the defensive arrangements of modern warships.

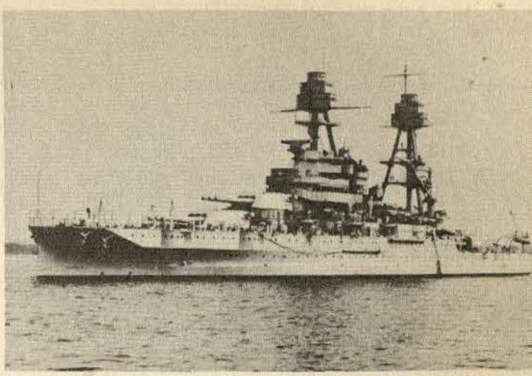
The defensive arrangements of modern battleships consist, briefly, of a heavily armored box, sometimes called the "citadel," which encloses on the top and sides all vital spaces containing propulsive machinery, magazines, and navigating and fire-control equipment. Extensions of this armored box enclose the heavy turret guns and ammunition, the most important ship and fire-control stations aloft, and the more important electrical leads by which machinery in these spaces is controlled or powered. Another extension protects the machinery which controls the rudder. The sides of the citadel are made of specially treated steel plates forming the armor belt or side armor, which may be as much as 16 in. thick. This armor belt extends several feet below the water line. A heavily armored deck forms the top of the "citadel," and one or more decks at higher levels are likewise armored. This horizontal armor provides protection against plunging hits of projectiles or bombs.

Protection against underwater explosion of torpedoes and mines is provided by a series of inner skins around the bottom from one side armor belt to the other, with intervening spaces divided into many watertight compartments, so that each skin and athwartships bulkhead must be pierced succesively before enough water can enter to jeopardize the ship.

With the development of air warfare, lighter armor called "splinter protection," to afford protection against small-arms fire and small flying fragments from bomb or projectile hits, has been placed around antiaircraft guns and vital ship and fire-control personnel and material in locations outside the armored box.

It is plain that armor and other purely defensive structures consume a considerable proportion of the total weight of the ship. In addition, the ship must carry a powerful armament, machinery capable of propelling it at high speeds, fuels and stores sufficient to give it great endurance, living spaces and food for a large crew, and also many spaces in which intricate and complex special-purpose machines can be installed and operated.

As no ship can ever carry all the features which the seamen wish the designers to put into it, the ship's characteristics are eventually determined by a series of compromises within the limitations of weight and space. Battleships, which must inflict and withstand heavy damage, are heavily armed and armored. Aircraft carriers and cruisers carry much less armor proportionately; small craft carry virtually none, depending on speed and maneuverability.



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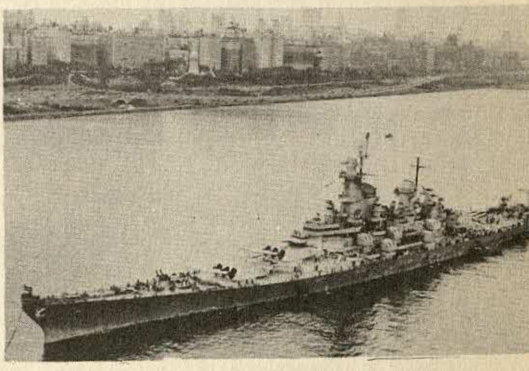


BATTLESHIPS OF TWO WORLD WARS

U.S.S. *Pennsylvania,* 1915 (*top*), and U.S.S. *Missouri,* 1944

See also *Navy;* and separate articles on some of the ships mentioned and on types of ship (*e.g., Submarine*).

Wart (*wa̧rt*), or VERRUCA, in medicine, a local malformation of the epidermis of the skin, forming a small projection.

Wartburg (*värt′bo͝ork̦*), a famous castle of Germany, near the city of Eisenach. It first became famous for the "War of Wartburg," a name given to a poetic contest held here in 1206, in which the minnesingers, including Walther von der Vogelweide (*q.v.*), were the contestants. At that time the castle was occupied by Hermann, landgraf of Thuringia, who made his court a haven for musicians, scholars, and artists. The castle was the scene of the legend of St. Elizabeth of Hungary, who was the wife of a Thuringian landgraf. Martin Luther lived at Wartburg (1521-22), and here translated the Bible into German, thus creating the basis of modern German.

Warthe (*vär′tę*), a river of Germany and Poland, the largest tributary of the Oder. It rises in the western part of Poland, 35 m. N.W. of Cracow, and, after a course of 540 m. toward the northwest, joins the Oder about 20 m. N. of Frankfort. The Warthe is navigable for 250 m. and its importance is greatly enhanced by several canals. Its valley is a highly fertile region, producing grasses, sugar beets, cereals, and fruits.

Wart Hog (*wạrt' hôg*), an animal of the swine family, native to Southern Africa. It is peculiar for having several warty growths on each side of the face, and tusks in both jaws which curve upward and outward. The tusks are an enlargement of the molar teeth, and their composition is similar to that of the tusks of an elephant. Wart hogs have large heads and feed on roots and bulbs of plants. The river, or water, hogs of Central Africa are allied animals, but spend much of the time in water. They are savage and ugly in appearance. The flesh of both species is esteemed as food.

Warwick (*wŏr'wĭḳ*), a residential city in Kent County, Rhode Island, *ca.* 10 m. S. of Providence. Situated on Narragansett Bay and the Pawtuxet River, it has a trade in sea food destined for large markets. It is served by the New York, New Haven & Hartford R.R. and an airport, and has some factories devoted to textiles, ironware, machinery, canning, and meat curing. Settled in 1642, the community was known as Shawomet, and was later named in honor of Robert. Earl of Warwick, who helped to secure a royal charter. The birthplace of Nathanael Greene, the Revolutionary War general, Warwick was incorporated in 1930. Population, 1950, 43,028.

Warwick (*wŏr'ĭḳ*), FRANCES EVELYN, COUNTESS OF, English society leader and philanthropist, born Dec. 10, 1861; died July 26, 1938. The wife of the 5th Earl of Warwick (died 1924), she began to interest herself in public welfare as a young woman. She served as a Poor Law Guardian and established a number of institutions, including Studley Castle, in Warwickshire, a college for training girls in horticulture and allied professions, and a school in Essex where boys and girls were given scientific and technical education. She also founded a home for crippled children at Warwick. A member of the Labour party and a Socialist, she was frequently referred to as "the Socialist Countess." She was the author of many books, including: "A Woman and the War," "An Old English Garden," "Life of William Morris," and "Nature's Quest."

Warwick, RICHARD NEVILLE, EARL OF, born Nov. 22, 1428; killed in battle Apr. 14, 1471. Called "the king-maker," he was a turbulent figure in the War of the Roses, and the most powerful noble in England at a time when the barons were more powerful than the throne. He was a member of the council which governed for Henry VI, the captain of Calais for five years, and leading promoter of the cause of the white roses of York. After he had defeated the Lancastrian forces at Towton (1461) he placed the Duke of York on the throne as Edward IV. For a time Warwick and his followers were the virtual rulers of England; but when Edward rebelled against their control Warwick went over to the side of Margaret of Anjou (*q.v.*) and the Lancastrians. He was killed at the battle of Barnet. Warwick acquired his title by marriage. His younger daughter, Anne, later became the wife of Richard III. See also *Roses, Wars of the.*

Warwickshire (*wôr'ĭḳ-shẽr*), a county in the Midlands of England. It has an area of 928.8 sq. m.

Warwickshire contains two of England's greatest cities: Birmingham (*q.v.*), with a population of 1,152,900 in 1939, and Coventry (*q.v.*), with 220,000 in the same year. Both these cities are located in the industrial northern section of the county, where the industries include coal-mining, quarrying, metal work, automobile and cycle manufacture, and many others. The county town is Warwick (population, *ca.* 13,500).

Southern Warwickshire is rural and agricultural. To the thousands who come every year to visit Shakespeare's birthplace at Stratford-upon-Avon (*q.v.*), the characteristic scenery of this region—gently rolling pastures, rich orchards and wheat fields, comfortable farms, shady lanes, and quiet villages—is far more closely associated with the name "Warwickshire" than is the urban north. Shakespeare's country has left is mark, too, in Shakespeare's plays. Christopher Sly in "The Taming of the Shrew" talks of country villages like Burton-Heath which must have been familiar to his creator. And, in the "Forest of Arden" and the "Wood near Athens," Rosalind and Celia, Puck and Bottom, sport, mock, and argue in surroundings that are recognizably those of Elizabethan Warwickshire.

The county is rich in domestic and ecclesiastical architecture, especially at Warwick and Stratford. Population, 1956 (est.), 1,930,000.

Wasatch Range (*wô'săch rānj*), a range of mountains extending south from the bend of the Bear River in southeastern Idaho to the Sevier River in central Utah. Most of Utah's largest cities lie just west of the range, which averages 10,000 ft. in height. The highest peak, Mt. Timpanogos, is over 12,000 ft. high.

Wash (*wŏsh*), THE, a shallow arm of the North Sea, 22 m. long and 15 m. wide, in eastern England, between Lincolnshire and Norfolk. It is the estuary of the rivers Nene, Ouse, Welland, and Witham. Navigation of the Wash is difficult because of many sandbanks.

Washburn (*wŏsh'bûrn*), county seat of Bayfield County, Wisconsin, 60 m. E. of Superior. It is situated on Chequamegon Bay, an inlet of Lake Superior, and on the Chicago, St. Paul, Minneapolis and Omaha R.R. The city has a fine harbor and is the center of a large trade in grain, lumber, and building stone. A Jesuit mission was established in the vicinity in 1665. Washburn was settled in 1884 and incorporated in 1904. Population, 1950, 2,070.

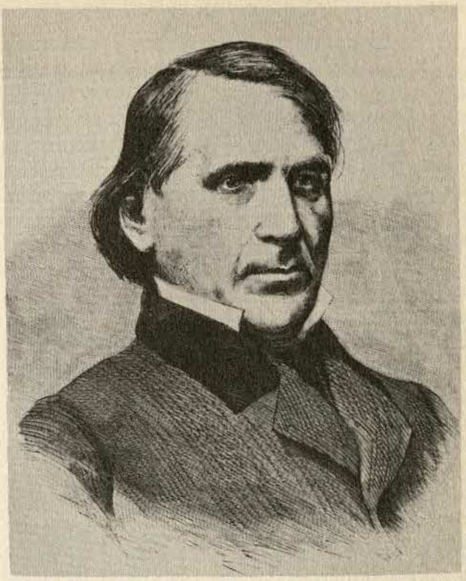
Washburn, three brothers who gained importance in U.S. politics, ISRAEL (born in Livermore, Me., June 6, 1813; died in Philadelphia, Pa., May 12, 1883); CADWALLADER COLDEN (born in Livermore, Me., April 22, 1818; died in Eureka Springs, Ark., May 14, 1882), and CHARLES AMES (born in Livermore, Me., March 16, 1822; died in New York City, Jan. 26, 1889).

Israel was a U.S. Representative (1851-61) and played an important part in the founding (1854) of the Republican Party. He also served (1861-62) as governor of Maine.

Cadwallader Colden, politician and general, was a member of Congress from Wisconsin (1855-61). In the Civil War he took part in the siege of Vicksburg, captured Ft. Esperanza in Texas (1863), and was commanding general (1864-65) of the Department of Western Tennessee. After the war he again served as Congressman from Wisconsin (1867-71) and was governor of Wisconsin (1872-74). Later he became a flour manufacturer in Minneapolis.

Charles Ames, editor and diplomat, graduated from Bowdoin Coll. (1848), went to California (1850), and entered the field of journalism. He was editor and proprietor (1858-61) of the San Francisco *Daily Times.* In 1861 he was appointed minister to Paraguay, where he served for seven years. Because of his participation in a plot against Paraguay's Pres. Lopez, Washburn had to flee the country on a U.S. gunboat. He wrote "A History of Paraguay" (1871). See also *Washburne, Elihu Benjamin.*

Washburne, ELIHU BENJAMIN, diplomat and statesman, and brother of Israel, Cadwallader Colden, and Charles Ames Washburn (*qq.v.*), born in Livermore, Me., Sept. 23, 1816; died in Chicago, Ill., Oct. 23, 1887. He studied at the Harvard Law School and was admitted to the bar (1840). After practicing law in Galena, Ill., he was elected to Congress (1852) and served until 1869. At the beginning of President Grant's administration Washburne was briefly secretary of state but resigned to accept an appointment as U.S. minister to France. He held this post from 1869 to 1877, remaining in Paris throughout the siege of that city in the Franco-Prussian War. He wrote "Recollections of a Minister to France" (1887). After leaving home, he added the "e" to his family name in 1830.



Courtesy Bettmann Archive, N. Y.

ELIHU B. WASHBURNE

Washington (*wŏsh′ĭng-tŭn*), county seat of Daviess County, Indiana, 20 m. E. of Vincennes. It is served by the New York Central and the Baltimore & Ohio R.R.'s and has large railroad shops. Located in the midst of a farming and dairying region, the city is also near extensive bituminous coal fields and has a large trade in grain, coal, flour, lumber, and dairy products. Manufactures include air-conditioning units, rubber goods, and building materials. Washington was settled in 1805, laid out in 1817, and incorporated in 1870. Population, 1940, 9,312; 1950, 10,987.

Washington, county seat of Washington County, Iowa, 65 m. s.w. of Davenport. Washington is served by the Burlington Route, the Chicago, Milwaukee, St. Paul & Pacific, and the Chicago, Rock Island & Pacific R.R.'s. It is surrounded by a rich agricultural and stock-raising region and has manufactures of buttons, calendars, cement products, and machinery. It was incorporated in 1864. Population, 1940, 5,227; 1950, 5,902.

Washington, a city of Franklin County, Missouri, on the Missouri River, about 51 m. w. of St. Louis. It is served by the Missouri Pacific R.R. and has manufactures of corncob pipes, stringed musical instruments, and shoes. Washington was founded in 1828 and incorporated in 1841. In 1833 many German immigrants settled here, and the city still retains traces of their customs and architecture. Population, 1940, 6,756 in 1950, 6,850.

Washington, a port city and county seat of Beaufort County, North Carolina, 108 m. S.E. of Raleigh, at the junction of the Tar and Pamlico rivers. The city is served by the Atlantic Coast Line and the Norfolk Southern R.R.'s and has a large trade in lumber, corn, cotton, tobacco, and fish. Settled in 1771 and incorporated in 1776, it was the first U.S. city to be named for George Washington. Population, 1940, 8,569; 1960, 9,939.

Washington, a city in southwestern Pennsylvania, seat of Washington County, 27 m. s.w. of Pittsburgh, on the Pennsylvania (freight) and Baltimore & Ohio (freight) R.R.'s. There are large deposits of coal, oil, and natural gas in the vicinity. Manufactures include decorative glass, containers, pumps, engines, steel and clay products, and bricks. The value added by manufacture in 1958 was $21,030,000. The city is the seat of Washington and Jefferson Coll., and the David Bradford House (1787), a meeting place in the Whisky Insurrection (*q.v.*), is located here. Washington was settled in 1769 and incorporated as a city in 1924. Population, 1960, 23,545.

Washington, a city and port of entry coterminous with the District of Columbia, capital of the U.S., ninth-largest city in the country, situated 40 m. s.w. of Baltimore, Md., on the northeast bank of the Potomac River, at the head of navigation. The site, *ca.* 70 sq. m., forms a natural amphitheater declining from the highest point, 420 ft. at Ft. Reno (in the northwestern section), to marshy lands along the Anacostia River, which bisects the eastern half of the city. Formerly surrounded by a prosperous agricultural region, the city is now in the heart of a metropolitan area of increasing density.

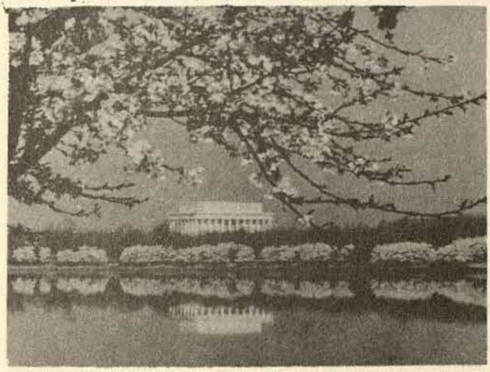
DESCRIPTION: Washington has been developed—with modifications—from a plan devised by Pierre Charles L'Enfant (*q.v.*), who was appointed by President Washington to draw up a plan within boundaries he had defined. In September 1791 L'Enfant was informed by the commissioners appointed to supervise the work that the Federal district would be called "the Territory of Columbia," and the Federal city the "City of Washington. . . . We have also agreed that the streets be named alphabetically one way and numerically the other; the former divided into north and south, and the latter into east and west numbers from the Capitol"—thus originating the N.E., S.E., N.W., and S.W. sections of the city. L'Enfant chose a rise of land 88 ft. high, known as Jenkin's Hill, about a mile from the Anacostia and equidistant from the Potomac for the site of the Capitol building, and placed the President's House on the line of a grand thoroughfare—Pennsylvania Ave.—approximately a mile to the northwest. West from the Capitol, and south from the President's House, he laid out a Mall, or park, extending to the Potomac River. Avenues 160 ft. wide bearing the names of the states radiated from the Capitol, the President's House, and open squares formed by the junction of avenues. Dr. William Thornton (*q.v.*) was the winner of a competition for the design of the Capitol, for which Washington laid the cornerstone with Masonic ceremonies on Sept. 18, 1793. See also *City Planning*.

Courtesy Library of Congress Collections

WASHINGTON CHANNEL

PARKS: The beauty of Washington is enhanced by its park system, begun by L'Enfant, whose plan for the old city reserved 607 acres for the Mall and small parks. Currently there are *ca.* 7,500 acres of park land within the District of Columbia. Easily accessible from the business section, the Mall and East and West Potomac Park—reclaimed from marshland along the river after 1901—are best known to tourists. Ohio Drive connects them with the Parkway along Rock Creek to the National Zoological Park. Beyond the zoo, 1,800 acres of natural woodland in Rock Creek Park offer many recreational facilities: bridle paths, golf courses, picnic groves, and the Carter Barron Amphitheater, where open-air theater performances are given in summer. During the summer months, the *Canal Clipper* plies the Chesapeake and Ohio Canal, begun in 1828 and closed to commercial use in 1924, which also affords ice skating during rare severe winters. Nature walks are conducted on Theodore Roosevelt Island (formerly Analostan), accessible by ferry from Georgetown. In the wide park area bordering the Anacostia River in N.E. and S.E. Washington are the D.C. Stadium, the National Arboretum, and the Kenilworth Aquatic Gardens. Fort Dupont, near the District line in the southeast, another area preserved in its natural state, is the largest of the parks surrounding each of the 19 Civil War forts encircling the city. The Cherry Blossom Festival in Potomac Park attracts thousands of tourists in April, when the Japanese cherry trees, presented to the nation by the city of Tokyo in 1912, are in bloom. Many small parks in the circles, squares, and triangles formed by the junction of the avenues and streets in the older sections—many the sites of statues or memorial fountains—are welcome islands of green in the stream of city traffic, but each year some of them are sacrificed to projects to ease the increasing flow of vehicles.

Capitol Hill: The U.S. Capitol (*q.v.*) is of principal interest to tourists, with its Great Rotunda, Grand Staircase, Statuary Hall, and the Senate and House Chambers. Opposite the Capitol grounds on First St. N.E. is the Supreme Court, designed by Cass Gilbert and completed in 1935. At Second and East and Capitol Sts. is the Folger Shakespeare Library (see *Folger, Henry Clay*).



Courtesy National Park Service

LINCOLN MEMORIAL

The Mall: From the west terraces of the Capitol, a fine view is obtained through the Mall to the heights of Arlington, Va. The Washington Monument, designed by Robert Mills, a marble obelisk, 555 ft. high, begun in 1848, was abandoned at 150 ft. before the Civil War. A new base was necessary when reconstruction was begun in 1876; it was opened to the public in 1888. The Lincoln Memorial (dedicated in 1922), designed by Henry Bacon, after the Greek Parthenon, is surrounded by 36 Doric columns representing the states in the Union in 1865. From the main chamber, 60 ft. high, 60 ft. wide, and 70 ft. long, the heroic, seated figure of Abraham Lincoln, by Daniel Chester French, looks eastward along the Mall. On the south shore of the Tidal Basin—used to flush the Washington Channel twice daily—the Jefferson Memorial, in the style of the Pantheon as adapted by Jefferson for the Rotunda of the Univ. of Virginia, houses Rudolph Evans' bronze statue of the author of the Declaration of Independence. Eastward along the Mall are the buildings of the Bureau of Engraving and Printing, the Dept. of Agriculture, the Smithsonian Institution, and the National Gallery of Art (*qq.v.*). North of the Mall, the Federal Triangle embraces a group of classical structures between Constitution and Pennsylvania Avenues—the Apex building (housing the Federal Trade Commission), the National Archives, the Internal Revenue Service, and the departments of Justice, Post Office, Labor, and Commerce. The White House (*q.v.*) is flanked on the east by the U.S. Treasury, in Greek Revival style, and on the west by the neoclassic bulk of the old State, War, and Navy building, now housing Executive offices. The Interior and State departments and several smaller government agencies are located in the Northwest, or Federal, Rectangle (north of Constitution Ave. and west of 17th St.), where the Pan American Union, American Red Cross, the Daughters of the American Revolution, and other foundations are housed in monumental buildings. From the Lincoln Memorial, the Memorial Bridge, one of the six across the Potomac, leads to Arlington Cemetery (see *Arlington; Tomb of the Unknowns*). A seventh span, the Theodore Roosevelt Bridge, above the Memorial Bridge, is under construction.

Photo by A. Rowe, courtesy National Park Service

JEFFERSON MEMORIAL

STREETS: Wisconsin Ave., the oldest street, was formerly High St. in Georgetown. Today it is a busy truck route leading out of the city. The longest street is Massachusetts Ave., traversing the District from the southeastern to the northwestern sections, interrupted only by the Anacostia River and the grounds of the District of Columbia General Hospital. It is the site of many embassies and churches in the northwestern section: the Mosque; the Greek Orthodox Cathedral of St. Sophia; the Protestant Episcopal Cathedral Church of St. Peter and St. Paul (known as National Cathedral); the Washington Hebrew Congregation; the Naval Observatory; and American Univ. The National Presbyterian Church and St. Matthew's Cathedral (Roman Catholic) are located just off Connecticut Ave., a fashionable shopping center below Florida Ave. Above this, it is lined with apartment houses and neighborhood shopping centers. From St. John's Church, Lafayette Square, 16th St. N.W. is lined with handsome buildings, among them those housing the A.F.L.-C.I.O., the National Geographic Society, the Carnegie Inst. of Washington, and the National Education Assn., as well as the Scottish

Both, courtesy Library of Congress Collections

OLD AND NEW CONTRASTED

On upper 16th St., N.W.

STEPS OF THE NATIONAL GALLERY

Rite Temple, the Church of Jesus Christ of Latter-Day Saints, the National Baptist Church, and many other churches and embassies. The main business and shopping district extends from 7th to 15th Sts., and Pennsylvania Ave. to K St. N.W., with a concentration of shops along F and G Sts.

TRANSPORTATION: Washington is served by several railroads, including the Baltimore & Ohio, Pennsylvania, Chesapeake and Ohio, and others. Naval vessels come up the Potomac to Washington and to the Naval Yard Annex on the Anacostia. Dulles International Airport is located at Chantilly, Va., *ca.* 20 m. from the city. Bolling Field and the Naval Station lie along the Potomac. Andrews Air Force Base furnishes military air transport to the capital.

COMMERCE: The capital's industry—largely retail trade—revolves around its position as the seat of government. The Government Printing Office, for instance, is the largest printing plant in the world, operating 24 hr. a day. Among the vast number of military establishments in the city are organizations as diverse as the Walter Reed Army Medical Center, the Army Map Service, and Ft. Lesley J. McNair. Aside from supplying the needs of the government, which has *ca.* 236,000 civilian employees in the city, Washington caters to more than 7,250,000 tourists and *ca.* 425,000 convention delegates annually. Among the larger downtown hotels are the Mayflower, Raleigh, Statler Hilton, and Washington; uptown convention centers are the Sheraton-Park and the Shoreham. The President's Cup Regatta in the late summer, the Christmas Pageant on the Ellipse south of the White House, and, every fourth year, the ceremonies accompanying the inauguration of the President are among the most important tourist attractions. Washington is the center of a standard metropolitan statistical area (1,485 sq. m.; pop., 1960, 2,001,897), comprising, in addition to the District of Columbia, two counties in Maryland and two cities and two counties in Virginia. The area had a value added by manufacture (1958) of $312,152,000. Washington had a value added by manufacture of $198,089,000.

EDUCATION: The public-school system enrolls *ca.* 134,000 pupils annually, including students in a teachers' college; more than 47,000 pupils attend parochial schools. There are five major universities in the city: the American, Catholic Univ. of America, George Washington, Georgetown, and Howard. The last three have medical schools. Other important institutions are Gallaudet Coll. (for the deaf), the U.S. Dept. of Agriculture Graduate School, Saint Elizabeths Hospital, and the National Institutes of Health. The Franciscan Monastery and many Catholic houses of study are affiliated with Catholic Univ. The Library of Congress (*q.v.*), with *ca.* 32,000,000 items, is the largest of the city's many reference libraries and is used by scholars and departments of government for specialized research.

Among the many museums in the city are the Army Medical Museum; the Aircraft Building of the Smithsonian; the Freer Gallery with its collection of Asiatic art; the Dumbarton Oaks Collection and Research Library; the D.A.R. Museum and Genealogical Library; the O. H. Oldroyd Collection of Lincolniana, housed in old Ford's Theater, where Lincoln was assassinated; the National Acad. of Sciences; the Volta Bureau, headquarters for the American Assn. to Promote the Teaching of Speech to the Deaf; and the Textile Museum of the District of Columbia.

Washington has two legitimate theaters, the National, which has occupied six buildings on the same site facing Pennsylvania Ave. since 1835, and the Arena Stage. Catholic Univ. has an active theater group, which presents plays each season in the university theater. Opera is occasionally offered at the Capitol, a downtown moving picture house. The National Symphony Orchestra, which was organized in 1931, holds an annual winter season in Constitution Hall, the D.A.R. auditorium.

GOVERNMENT: See *District of Columbia.*

HISTORY: Captain John Smith, sailing up the Potomac to the fall line in 1608, found the land in possession of Indians of the Algonquian tribes, living in villages along the Potomac and the Anacostia. Near the site of one of these, Tohoga, the Maryland Assembly in 1751 authorized the laying out of Georgetown, which was incorporated in 1789. In January 1791 President Washington named three commissioners to supervise the surveying of the site and the planning of the Federal City in an area 10 m. square—including the towns of Georgetown and Alexandria ceded by Maryland (1788) and Virginia (1789). The Federal government moved to Washington from Philadelphia in 1800, but only the north wing of the present central portion of the Capitol was completed when Congress convened in November. Benjamin Latrobe, appointed director of works by President Jefferson in 1803, completed the south wing, which was connected to the north building by a wooden arcade when the Capitol was burned by the British during their invasion of Washington in August 1814. Latrobe had restored the wings by 1819, when Charles Bulfinch began the erection of the central building, topped by a wooden dome in 1827. The two extensions, now used by the Senate and House of Representatives, were begun in 1851, and the present impressive cast-iron dome, weighing 8,909,200 lb., was finished in December 1863 when Thomas Crawford's 19-ft. bronze statue of "Freedom," above the lantern, was dedicated.

Growth of the city was slow: from a population of 3,210 in 1800, it had increased to only 23,264 in 40 years. At Virginia's request, the 30 sq. m. ceded by that state were returned to her in 1846. When President Lincoln drove out to Ft. Stevens to witness the repulse of the Confederate attack on the Union capital during the Civil War, Washington was little more than a large southern village loosely filling the boundary laid down by the first President. But between 1860 and 1870, it accelerated its population from 61,122 to 109,199.

From its incorporation by Congress in 1802, the city had been governed by a mayor and council, and Georgetown had retained its independent organization. In 1871 Congress established a territorial government for the entire District of Columbia and revoked the Georgetown charter. The last of the territorial governors, Alexander R. Shepherd, began a program of street grading, paving, lighting, and tree planting, sewage disposal, and other improvements. A modern city began to emerge, but charges of extravagance led Congress to authorize a temporary government in 1874. An "Organic Act" was passed in 1878, establishing the present form under which the city is administered (see *District of Columbia*). The World's Columbian Exposition at Chicago in 1893 inspired a renascence of city planning. In 1901 Congress adopted the plan of Sen. James McMillan, of Michigan, for laying out parks and grouping government buildings. This incorporated features of L'Enfant's plan, heretofore ignored, and controlled the development beyond the old boundary where speculators ran wild. During World Wars I and II, many so-called temporary buildings were erected in the Mall, some of which are still standing. Development of the city is progressing under a 1950 plan, with a tendency to place government buildings outside the city, for example, the Pentagon (*q.v.*), the Atomic Energy Commission at Germantown, Md., and the Central Intelligence Agency at Langley, Va.; or in redevelopment sectors, such as "Foggy Bottom," west of the White House, site of the new State Dept. Building.

The population increased from 61,122 in 1860 to 109,199 in 1870, to 188,932 in 1890, to 331,069 in 1910, to 663,091 in 1940, to 802,178 in 1950; by 1960, however, it had declined to 763,956.

WASHINGTON MONUMENT

Photos by A. Rowe, courtesy National Park Service

Washington, a state in the Pacific section of the U.S., an empire of rugged snow-capped mountains, dense forests, and high, arid plateau country. Well known for its lumber, salmon, and apples, Washington is also a

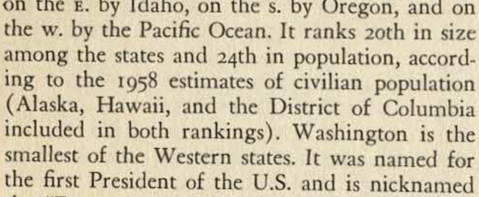
1889

prominent producer of wheat and hydroelectric power. Located in the northwest corner of the mid-continental U.S., it is the gateway to Alaska and the countries on the northern rim of the Pacific Ocean. Within the state is the largest single structure ever built by man, the Grand Coulee Dam.

Washington is bounded on the N. by Canada, on the E. by Idaho, on the S. by Oregon, and on the W. by the Pacific Ocean. It ranks 20th in size among the states and 24th in population, according to the 1958 estimates of civilian population (Alaska, Hawaii, and the District of Columbia included in both rankings). Washington is the smallest of the Western states. It was named for the first President of the U.S. and is nicknamed the "Evergreen State" and the "Chinook State."

GEOGRAPHY

The Cascade Mts., running from north to south through the state, divide Washington into two distinctly different parts, the inland side being somewhat the larger. On the western, or Pacific, side is a narrow coastal plain, deeply indented in the northwest by Puget Sound, a narrow bay nearly filled by over 170 islands, including the San Juan group, Whidby Island, and others. One shore of Puget Sound is formed by the Olympic Peninsula, which juts out from the rest of the state like a protruding thumb.



Location	Between ca. 117° and ca. 124°40′ W. long. and ca. 45°30′ and ca. 49° N. lat.
Area	68,192 sq. m.
Land	66,786 sq. m.
Inland water	1,406 sq. m.
Greatest extent:	
North to south	230 m.
East to west	340 m.
Population (1950)	2,378,963
Capital city	Olympia
Highest point	Mt. Rainier (14,410 ft.)
Lowest point	Sea level (Pacific Ocean)
Admitted to the Union (42nd state)	1889
Song	"Washington My Home," words and music by Helen Davis
Flower	*Rhododendron macrophyllum*
Bird	Willow goldfinch
Motto	*Al-ki* (Indian, meaning "Bye and Bye")
Flag	See color plate in Vol. XI

A lower chain of mountains, the Coast Range, parallels the Cascades on the west, with the Puget Sound Basin in between, rimming the bay from which it takes its name. In the Puget Sound Basin are the chief ports of the state, Tacoma and Seattle, and much of Washington's manufacturing and commerce is carried on here. Opposite Seattle is Bremerton, with its important Navy yard.

The Cascades are among the highest mountains in the U.S., with several peaks over 2 m. high, and one, Mt. Rainier, towering a majestic 14,410 ft. Volcanic in origin, the Cascades are heavily forested. The highest of the Cascade peaks have snow-covered crests far above the timber line. Glaciers thrust their way down their sides. The western slopes of the Cascade Range are the heart of the state's logging industry, since the heavy rainfall piled up by the mountain barrier causes a luxuriant growth of trees.

East of the Cascade Range are two types of country. In the northeastern section of the state are the Okanogan Highlands, a region of ridges, valleys, and rolling hills. In the valleys of this section grow Washington's famous apples. In these mountains, which range up to 7,000 ft. or more in height, is found much of the mineral wealth of Washington, including gold, silver, magnetite, and limestone. Although not ranking with the area west of the Cascades, the Okanogan Highlands are also a timber-producing region.

Southeastern Washington contains the Columbia Plateau. A bowl-shaped area, the plateau is rimmed by the Rocky Mts. on the E., the Cascade Range on the W., the Okanogan Highlands on the N., and the Blue Mts., coming up from Oregon, on the S.E. Although this tableland is very dry and has a desertlike appearance, the lava soil is fertile and well suited to irrigation. Reclamation projects such as the Grand Coulee Dam have turned thousands of acres of sagebrush and scrub into prosperous wheat farms. Elevations here range from about 500 to 2,000 ft.

WASHINGTON

The Columbia River rises in Canada and enters Washington from the north, wending its way southward and westward by turns, edging ever closer to the Cascades. Near the Oregon border it is joined by the Snake River, its main tributary, which is itself a stream of considerable size. Turning abruptly seaward, the Columbia plunges through the Cascades in a narrow gorge of breath-taking beauty. Third only to the Missouri and Mississippi rivers in length in the U.S., the Columbia is dammed at several points to provide water for irrigation and hydroelectric power. The largest of the dams, Grand Coulee, backs up the river over 150 m. to the Canadian border. Its crest is half as wide and twice as high as Niagara Falls. The Bonneville, McNary, and Chief Joseph dams are also of impressive size.

Lake Chelan, between the Okanogan Highlands and the Cascades, is a winding, narrow body of water 55 m. in length, with steep canyon sides. The northwestern end of the lake is a prime recreation area. Another popular area is Olympic National Park, which encloses most of the center of the Olympic Peninsula. The park is unique as one of the last remaining stands of virgin wilderness in the U.S., and its dense forest receives the heaviest rainfall in the country. Mount Rainier, center of another national park, is probably the state's best-known landmark.

In eastern Washington are several coulees, or dry canyons, the most famous being Grand Coulee at Coulee City. Carved by the Columbia River in prehistoric times, Grand Coulee became a dry canyon when the river changed its course, only to be filled in again by man with water from the Grand Coulee Dam.

Climate: West of the Cascades, Washington has a very mild and even temperature, ranging from an average of about 40° F. in the winter months to an average of about 62° F. in the summer. Rainfall in the Puget Sound area is about 35 in. annually, but on the Olympic Peninsula it reaches 145 in., the record for the U.S. Eastern Washington is very dry, with a much greater temperature range. Temperatures are recorded in the 90's in the summer and below 20° F. in the winter. Rainfall is heaviest in December and January along the coast and from November to January in eastern Washington. There is little snow in the coast area, but the Cascades and eastern Washington receive heavy falls, the average annual snowfall for Spokane being 64 in.

ANNUAL STATE EVENTS

Treaty Day Pow wow	Jan. 22; Swinomish, Tulalip, and Lummi Indian reservations
Rhododendron Festival	April; Port Townsend
Apple Blossom Festival	May; Wenatchee
Salmon-fishing derbies	June, Tacoma; Sept. 11, Seattle; Labor Day, Port Angeles
Lake Chelan Rodeo	Last week in July; Chelan
Fleet Week	Third week in September; Seattle
Admission Day	Nov. 11; statewide

Courtesy Northern Pacific Railway

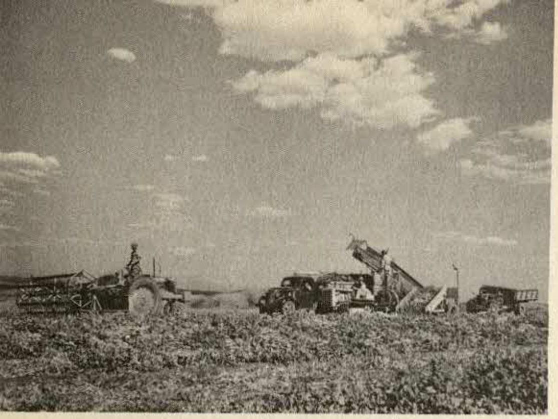
MT. RAINIER, WASHINGTON

	Seattle	Spokane
Normal temperature		
January	40.7° F.	24.9° F.
July	65.5° F.	69.5° F.
Annual mean	53.2° F.	47.1° F.
Latest frost	Feb. 23	April 20
Earliest frost	Nov. 26	Oct. 12
Precipitation		
January	4.49 in.	1.72 in.
July	0.52 in.	0.49 in.
Annual mean	31.92 in.	14.92 in.
Average growing season	255 days	184 days

NATURAL RESOURCES

One of Washington's most important resources is the enormous stand of timber which covers the slopes of the Cascade Range. The Douglas fir, which grows mainly on the western side of the mountains, is the most important tree, but the Ponderosa pine, western hemlock, Sitka spruce, and western red cedar are also prominent. Many of the logging companies now operate on a tree-farm basis, whereby they replant cutover forest with young trees. In other areas, only small sections are logged at a time, the adjoining areas eventually filling in the gap with seedlings. More than half of Washington is still forested after a century of timber production. Of the state's more than 23,000,000 acres of forest land, almost a third is under Federal control.

The Columbia River is estimated to have a third of the potential water power in the U.S. Dams such as the Grand Coulee and Bonneville have harnessed only a fraction of this reservoir



Courtesy Chamber of Commerce, Walla Walla, Wash.

PEA HARVEST NEAR WALLA WALLA, WASHINGTON

Walla Walla is the center of the greatest pea producing area in the world

of energy. The abundance and cheapness of electric power have attracted such industries as aluminum refining and the Hanford atomic works, whose atomic piles are an enormous consumer of electricity.

The wheat lands of the eastern part of the state provide the largest single agricultural resource. The Columbia Plateau has soil of lava origin, which is very productive when given sufficient water.

Cutover forest land in the state is often converted to pasture, and Washington has thus developed a large dairy industry.

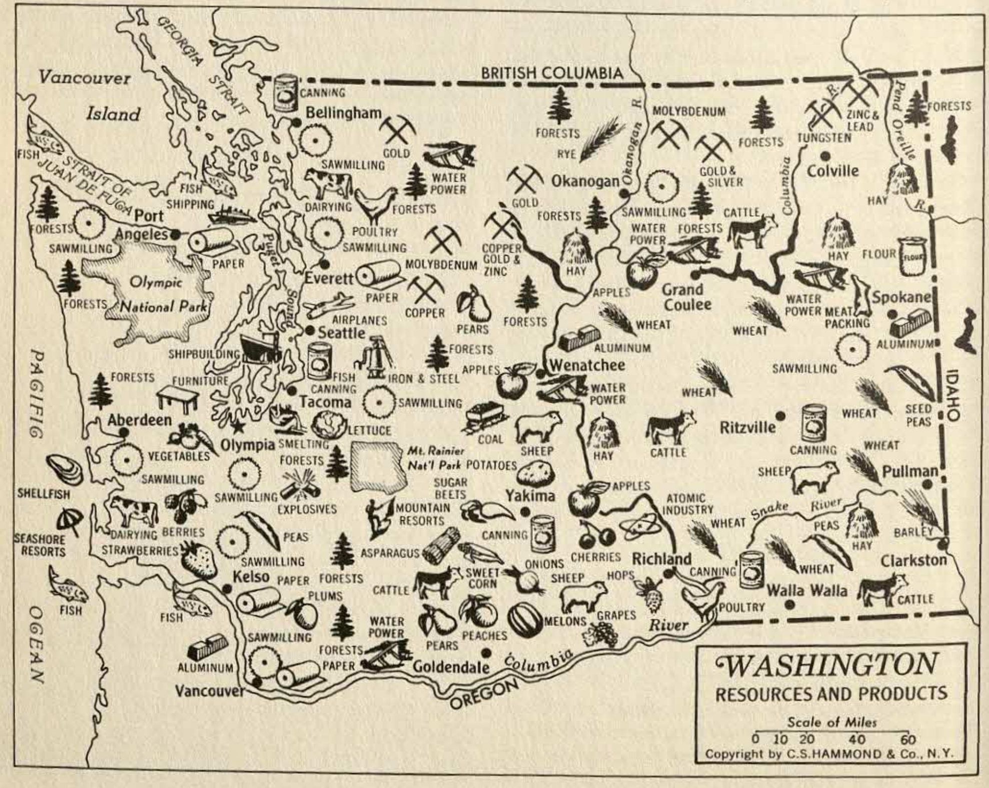
Once a much larger industry, salmon fishing has suffered from dam building and water pollution, but it is still an important operation in the state. Shellfish, such as oysters, crabs, and clams, are plentiful on the coast, and offshore waters yield catches of halibut, sole, cod, and flounder.

The minerals of the state include the largest U.S. deposits of magnetite, together with limestone, gold, silver, lead, zinc, soft coal, and copper in small quantities.

Conservation is a vital matter in Washington. Fire detection and fighting, the regulation of lumbering practices, and a program of research and reforestation help to preserve one of the state's important resources. Prevention of water pollution, the building of "fish ladders" around dams, and the restocking of streams have done much to help the salmon industry. Irrigation and research into dry-farming methods have made Washington a prominent wheat producer, and have won the state an enviable record for per-acre yields.

WASHINGTON'S ECONOMY

Manufacturing is playing an increasingly important role in Washington's economy, attracted



by the state's electric power, timber, abundant food products, and favorable location with regard to transportation. This sector of commercial activity employed 21 per cent of the state's total civilian labor force of 839,773 in 1950.

Washington ranked third in U.S. lumber production and first in the production of wood pulp in 1954. In 1952, 4,462,000,000 bd. ft. of timber were cut, and 2,377,000 tons of pulp were produced. Based upon this industry are such allied manufactures as the making of paper, plywood, shingles, composition board, wooden and cardboard boxes, and wood chemicals. In 1954 the value added by manufacture of lumber and wood products was $319,660,000; of pulp and paper products, $221,281,000. Many printing and publishing enterprises have found it profitable to locate themselves close to the source of their primary material. Most of the lumber milling and other processing is carried on in the Puget Sound area. Washington also supplies the logging industry with many of its heavy-duty saws, cranes, presses, and other items of equipment. Other important industries are the making of aircraft, centered in Seattle, and the refining of aluminum. Total value added by all types of manufacture in 1956 was $1,942,000,000. The next most important employer was the wholesale and retail trade field, engaging 174,000 persons.

Washington had a total farming acreage of *ca.* 17,575,000 in 1954, the average farm being 270.4 acres. Wheat is the state's most important single product, and 69,333,000 bu. were produced in 1957, making the state the outstanding producer west of the Rockies. Dairy products are next in importance, with apples, meat, and berries occupying important positions. Washington is the chief U.S. producer of apples, raising about a quarter of the total crop. The center of this activity is the eastern slope of the Cascades, around Wenatchee and Chelan. The food-processing business is a large one in Washington, and, including meat packing, the value added by manufacture came to $219,645,000 in 1954. In 1957 the total cash income from crops, livestock, and government payments amounted to $589,183,000.

Mineral production in 1956 was valued at $61,665,000. Washington ranked 30th among the states in this field in 1955, producing .43 per cent of the U.S. total. Sand and gravel, cement, stone, and zinc were the most important minerals, in that order. Other minerals produced are magnetite, lead, soft coal, gold, and silver.

In 1956 the state government estimated the tourist business in the state of Washington to have been worth $271,000,000.

The packing of salmon and other sea food is declining, but it is still an important Washington business. The value of shipments of canned and packaged sea food in 1954 was $41,638,000.

TRANSPORTATION AND COMMUNICATION

The Puget Sound area provides excellent sheltered harbors, and the ports here are the closest U.S. mainland ports to Alaska and the Orient. Seattle, the largest port in the state, handled 12,481,242 tons of shipping in 1955. Next in importance are Tacoma, Bellingham, and Olympia. Grays Harbor on the open Pacific, and Longview, on the Columbia River, are also important. The Columbia River is navigable for 500 m. from the sea.

The first railroad in Washington was the Cascade R.R., established in 1863 but now abandoned. Washington had 4,982 m. of railroad in 1958. The principal railroads serving the state today are the Great Northern Ry.; the Northern Pacific Ry.; the Chicago, Milwaukee, St. Paul and Pacific R.R.; the Union Pacific R.R.; and the Spokane International R.R. Roads, important to the logging industry as well as to motorists, totaled 58,667 m. in 1956; of this figure, 44,760 m. were surfaced. All the major cities and towns have airfields. The state had 88 radio and 17 television stations in 1956. The first newspaper in Washington was the Olympia *Columbian* (1852). Among today's leading newspapers are the Seattle *Times* and *Post-Intelligencer;* the Spokane *Spokesman Review;* and the Tacoma *News-Tribune.*

POPULATION

Washington has 39 counties. The state's 1950 urban population comprised 63.2 per cent of the total population; the rural population, 36.8 per cent. Between 1940 and 1950, the urban population rose 38.2 per cent over that of 1940; the rural population, 35.7 per cent. Almost a third of Washington's population lives in the urbanized areas of Seattle, Tacoma, and Spokane. Washington's population was estimated at 2,769,000 on July 1, 1958. In 1950 white persons numbered 2,316,496; of these, 2,125,495 were native born and 191,001 were foreign born. Nonwhite persons totaled 62,467; of this group, 30,691 were Negroes, and 13,816 were Indians, with the remainder including Japanese, Chinese, and others. Population density in 1950 averaged 35.6 per sq. m.

The major religious faiths, in order of size, in 1950 were the Protestant and the Roman Catholic, with only a very small Jewish group. The predominant Protestant bodies were The Methodist Church; the Presbyterian Church in the U.S.A.; the Protestant Episcopal Church; the Evangelical Lutheran Church; the Disciples of Christ, International Convention; the American Baptist Convention; the Lutheran Church—Missouri Synod; and the Congregational Christian Churches.

Chief Cities: Seattle, on Puget Sound in northwest Washington, is the state's largest city and its chief port and trading center.

Spokane, in eastern Washington near the Idaho border, is the state's second-largest city and trade center for the inland wheat and mineral region.

Tacoma, on Puget Sound, ranks third in size and is an important port and industrial city.

Olympia, the state capital, is also a port at the head of Puget Sound.

Famous Men and Women: Boeing, William Edward (1881-1956), industrialist, builder of multi-engined aircraft.

Crosby, Harry Lillis (1904-), singer and actor, known as "Bing" Crosby.

Gray, Capt. Robert (1755-1806), sea captain and explorer, who discovered Grays Harbor and the Columbia River.

Mercer, Asa (1839-1917), educator, founder of Territorial Univ. (later the Univ. of Washington). He brought the "Mercer Girls" to Washington.

Munsel, Patrice (1925-), opera singer.

Stevens, Isaac Ingalls (1818-62), soldier, engineer, and statesman. He surveyed route for the northern transcontinental railroad and became first governor of Washington Territory (1853-57).

Wainwright, Jonathan M. (1883-1953), World War II hero, who led the defense of Bataan and Corregidor.

Whitman, Marcus (1802-47), New York-born missionary and doctor, who helped establish the U.S. claim to Oregon Territory. With his wife and 12 others he was massacred by Cayuse Indians (1847).

EDUCATION

Education is free and compulsory for children between eight and 16. The state's current public-school system was established in 1895. Public-school enrollment totaled 569,150 in 1957. The leading state-supported institutions of higher learning include the Univ. of Washington at Seattle; Washington Coll. of Education, with campuses at Ellensburg, Cheney, and Bellingham; and Washington State Univ., at Pullman. Private and denominational colleges include Gonzaga Univ., Spokane, and Whitman Coll., Walla Walla.

Cultural institutions include the Seattle Art Museum, which houses an outstanding collection of ancient and modern art works from Oriental countries and the Kress Collection of Italian, Flemish, and Dutch paintings; the museum of the Seattle Historical Society, also in Seattle; a geological museum, at Ginkgo Petrified Forest, Vantage; and a museum dedicated to Marcus Whitman's missionary effort, at Whitman Coll. Indian and pioneer relics may be seen at the State Museum at the Univ. of Washington and at the museum of the Eastern Washington Historical Society, Spokane.

GOVERNMENT

Washington is governed under provisions of a constitution dating from 1889 and amended many times. The constitution grants the people of the state powers of initiative and referendum. Citizens of the state may also exercise the right of recall, whereby state officials considered unsatisfactory may be removed from office by popular vote.

The state constitution gives executive authority to a governor, lieutenant governor, secretary of state, attorney general, treasurer, auditor, superintendent of public instruction, and several other officials, each elected for a term of four years. The legislature consists of a senate of 49 members and a house of representatives of 99 members, senators serving for four years, and representatives, for two years. The legislature meets in Olympia, the state capital, for regular sessions of 60 calendar days, beginning on the second Monday in January of the odd-numbered years. The supreme court of Washington has nine justices, elected for six years. Other courts in the state are the county superior courts, justice-of-the-peace courts, and police courts. Washington is represented in the U.S. Congress by two Senators and seven Representatives.

HISTORY

A Greek captain, Apostolos Valerianos, in the employ of the Spanish viceroy of Mexico, Juan de Fuca, is believed to have been the first white person to sight the coast of Washington, during a voyage in 1592. Sir Francis Drake, in 1578, may also have reached as far along the coast as the Olympic Peninsula, but this is uncertain. Vitus Bering, sailing for Russia, discovered Alaska in 1841, and as a result the Russians were active in exploration and trade along North America's Pacific coast over the following decades. After almost two centuries of unconcern for this area, the Spanish, worried by Russian penetration from Alaska southward down the coast, sent Bruno Heceta and Juan de Bodega y Quadra to the Pacific Northwest in 1775; they were the first white men known to have set foot on Washington soil. A landing party put ashore on Destruction Island, off the Olympic Peninsula, but was massacred by the Indians. In 1778 England's famous Capt. James Cook charted the Washington coast (but failed to notice Juan de Fuca Strait).

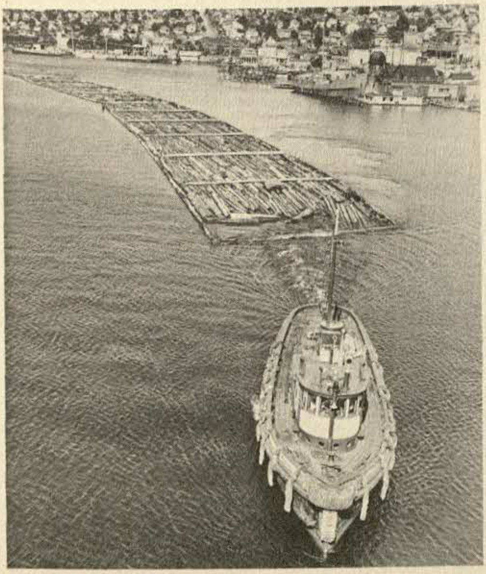
The U.S. entered the scene in 1788 when Capt. Robert Gray, financed by Boston merchants, reached the area and bought a cargo of furs. Returning in 1792, Gray discovered the Columbia River, which he named for his ship, and, farther up the coast, the port now called Grays Harbor. Meanwhile, the Spanish had returned, under the general command of Esteban Martínez, in 1790. One Spanish officer, Francisco Eliza, had landed

PART OF THE INLAND EMPIRE

The arid eastern section of Washington, with its gently rolling hills and fertile valleys, was early used to support cattle and sheep. The large ranches are still in operation, and livestock raising contributes substantially to the state's agricultural output. Irrigation has helped to expand Washington's agriculture by opening up large areas to farming. This land is among the most productive areas in the nation, with wheat and fruit the principal crops (*courtesy Washington State Advertising Comm.*)

PROSPECTIVE BRIDES SET SAIL

Indian troubles slowed the territory's settlement, and there was such a shortage of women that in 1864 Asa Mercer decided to go east to find ladies who would undertake the long, hazardous voyage around Cape Horn and the hardships of a pioneer life. The first "Mercer Girls" to arrive seeking husbands among the lumbermen, fishermen, and prospectors were such a success that two years later "President" Mercer recruited another group; A. R. Wand sketched these women as they sat on deck of the *Continental,* the ship which was to take them to their new home; his drawings appeared in the *Harper's Weekly* of Jan. 6, 1866



SEATTLE LOG TOW
Great forests support an active lumber industry (*courtesy Washington State Advertising Comm.*)

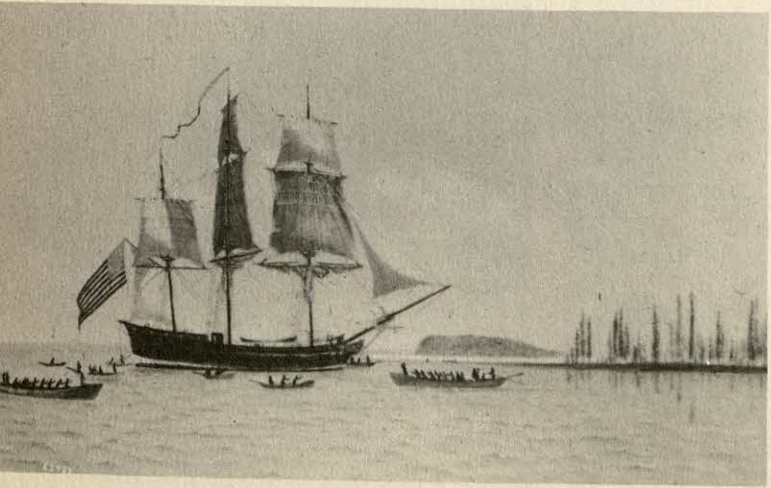
APPLE SELECTION AND PACKAGING
The fruit is shipped to all parts of the world (*courtesy Washington State Apple Comm.*)

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	*Size and Location*	*Points of Interest*
Coulee Dam National Recreation Area (established 1946)	98,500 acres, near Grand Coulee (state 10-B)	Franklin D. Roosevelt Lake (artificial lake formed by Grand Coulee Dam); swimming and boating
Mount Rainier National Park (established 1899)	241,782 acres, near Longmire (state 5)	The greatest single-peak glacial system in the U.S.; forests and meadows; deer, bear, mountain goats; wild flowers; skiing, hiking, fishing
Olympic National Park (established 1909)	896,599 acres, near Port Angeles (U.S. 101)	One of the last virgin-wilderness areas of the U.S.; alpine meadows, glacial peaks, and dense forest; Crescent Lake; Roosevelt elk
Whitman National Monument (established 1940)	46 acres, near Walla Walla (U.S. 410)	Shaft marks site of massacre of missionary Marcus Whitman and family (1847)
Gifford Pinchot National Forest (established 1893)	1,421,562 acres, near Carson (U.S. 830)	Ice cave; lava beds
Mount Baker National Forest (established 1897)	1,851,562 acres, near Glacier (state 1)	Waterfalls; trails; glaciers
Okanogan National Forest (established 1897)	2,090,631 acres, near Chelan (U.S. 97)	Lake Chelan; waterfalls
Olympic National Forest (established 1897)	689,832 acres, near Ovington (U.S. 101)	Dense rain forest; beaches
Snoqualmie National Forest (established 1897)	1,538,142 acres, near American River (U.S. 410)	Mountain lakes and trails
Beacon Rock State Park (established 1935)	3,052 acres, near North Bonneville (U.S. 830)	Largest single rock in U.S., second only to Gibraltar in size; view of Columbia Gorge
Deception Pass State Park (established 1922)	1,746 acres, on Whidby Island (state-1-D)	Most popular resort area west of the Cascades; cliffs, forests, beaches; narrow channel discovered by Capt. Vancouver (1792); views of San Juan Islands
Sacajawea State Park (established 1923)	20 acres, near Pasco (U.S. 395)	Site of Lewis and Clark camp (1805); the Indian woman Sacajawea guided the explorers here to the junction of the Snake and Columbia rivers
Sun Lakes State Park (established 1933)	2,400 acres, 6 m. S. of Coulee City (state 7)	Most popular recreational park east of the Cascades
Dry Falls area (established 1933)	480 acres, near Coulee City (U.S. 2)	Site of Columbia River falls in prehistoric times; now dry, it was once many times the size of Niagara Falls
Ginkgo Petrified Forest Area (established 1934)	5,980 acres, near Ellensburg (U.S. 10)	Petrified forest includes a ginkgo log (this species now native only to China)

at Neah Bay and claimed the area, while another, Manuel Quimper, explored the San Juan Islands. In 1792, after meeting Capt. Gray, British Capt. George Vancouver sent a party up the Columbia River in small boats to what is today Vancouver, Wash. Earlier the same year, Vancouver found and named Puget Sound (for two officers) and Mt. Rainier (for his admiral). The Lewis and Clark expedition, coming overland from St. Louis, reached the mouth of the Columbia in 1805, thus strengthening the claim of the U.S. to the territory. In 1810 the British trader-geographer David Thompson established Spokane House, the first trading post and first permanent white settlement in the present state. The American fur king, John Jacob Astor, organized the American Fur Co. in the same year, and in 1811, at Ft. Okanogan, the first American flag flew over what is now part of Washington State.

In 1818 the U.S. and Great Britain agreed to occupy the Oregon country jointly; but the British, with their well-organized Hudson's Bay Co., soon began to get the upper hand in the fur trade. In 1836, however, the American mission-



THE COLUMBIA RIVER

Captain Robert Gray's ship, the *Columbia*, lies at anchor in the river named after it. Gray was the first to pass the dangerous bar and sail into the river (May 11, 1792). His exploit was a contributing factor in establishment of the U.S. claim to the entire Pacific Northwest (*courtesy Washington State Historical Society, Tacoma, Wash.*)

aries, Marcus Whitman and H. H. Spalding, set up a mission near Walla Walla. Their letters home created much interest, and settlers soon began to arrive. They came in very great numbers during the early 1840's, and the "Great Migration" of 1843 resulted in an American majority in the area. By 1844, obtaining full possession of the Oregon Country had become a main issue in the Presidential election. A compromise with England was reached in 1846 whereby the boundary along the 49th parallel was extended to the Pacific Ocean, but all of Vancouver Island remained British.

Washington first became a part of the Oregon Territory in 1848. In 1853 the land north of the Columbia River was organized as Washington Territory. In 1863 Idaho Territory was detached, and Washington acquired its present boundaries.

During the territorial period, Asa Mercer conceived the idea of bringing widows and orphans of the Civil War to this land where white women were all but unknown. In 1864 and again in 1866 shiploads of "Mercer Girls" arrived and were eagerly courted and married by the pioneer men.

The direct connection of Washington with the East by the completion of the Northern Pacific R.R. in 1887 proved to be a powerful argument for statehood, and Washington was admitted to the Union in 1889.

With the arrival of the railroads, the Puget Sound area began to develop into a great shipping center. Trans-Pacific steamer service started in 1896, and the Klondike gold rush of 1897 not only gave the Alaska trade new importance but provided a much-needed impetus to the state's economy, which had suffered as a result of the panic of 1893. The Klondike gold rush also made Seattle the primary city in the state. During the following years, the enormous power potential of the Columbia Valley was harnessed; the climax of this project was the completion of the Grand Coulee Dam in 1941.

Washington contributed eagerly to the winning of both World Wars. The state furnished 66,870 men and women to the armed forces during World War I and 224,083 during World War II. During the Second World War, Seattle factories manufactured the Flying Fortress (B-17) and the B-29, and Puget Sound shipyards broke shipbuilding records. After the war, home-coming veterans found that Grand Coulee Dam had made nearly a million acres of additional land available for farms. The dams have also led to an increase in the importance of manufactures in the state's economy; and many new industries have been attracted to Washington by its varied resources, especially hydroelectric power.

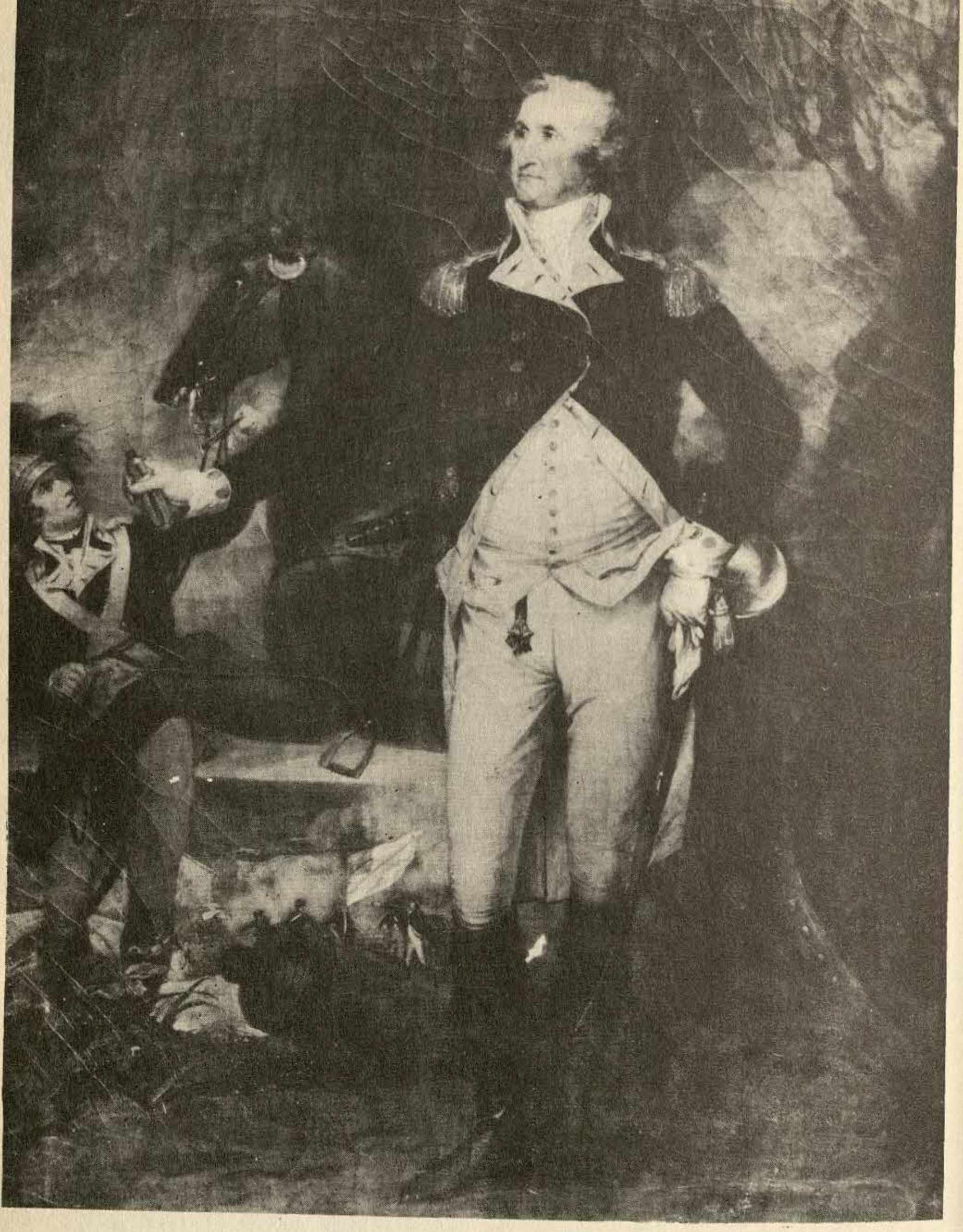
See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

BOOKER T. WASHINGTON
Monument at Tuskegee Inst. by Charles Keck (1875-1951)

Washington, BOOKER TALIAFERRO, educator, born a slave on a plantation at Hale's Ford, Va., April 5, 1856; died in Tuskegee, Ala., Nov. 14, 1915. His father is believed to have been a white man. After being emancipated, his mother moved to Malden, W. Va., where Washington began to acquire an education by a combination of self-study, night lessons, and regular classes—all undertaken while he worked in salt and coal mines and later as a household servant. Overhearing talk of Hampton Inst., a Negro school, he traveled 500 m. to enroll and spent three years there (1872-75), earning his living expenses as a janitor. After several years of teaching at Malden and acquiring an additional winter of schooling at Wayland Inst. in Washington, D.C., he became an instructor at Hampton Inst. in 1879. In 1881 he was invited to start a Negro normal school in Tuskegee, Ala.

The development of this institution was the major work of his life. Starting as a dilapidated shanty with 40 students, Tuskegee Inst., at Washington's death, had 197 faculty members, 1,537 students, 27,000 acres of land, and an endowment of *ca.* $2,000,000. A recognized leader of the Negro people in his day, Washington was moderate in his immediate ambitions for them. He stressed their industrial education more than political or social rights, and his influence on race relations was pacific. He wrote a number of books, including the autobiographical "Up From Slavery" (1901).

Washington, GEORGE, first President of the U.S., known as the "Father of his country," born in Westmoreland County, Virginia, Feb. 22, 1732;



Courtesy Metropolitan Museum of Art, N. Y.

GEORGE WASHINGTON

Painting by John Trumbull (1756-1843)

died at Mt. Vernon, Dec. 14, 1799. His family belonged to the second order of Virginia gentry, *i.e.,* prosperous planters but not leading figures in the colony. His education was the product of his own interest in books and of tutoring by his father, Augustine Washington (died 1743), and his half-brother, Lawrence Washington (died 1752).

In 1748, Thomas, Lord Fairfax (1692-1782), who counted a neighboring plantation among his Virginia lands, chose George Washington to accompany his son and his surveyor on a trip to locate his holdings in the Shenandoah country. With this experience began Washington's concern for the fate of the West, a concern which shaped his investments and helped to make his sentiments national rather than particularist. He began to work as a surveyor on his own account in 1749, but that activity was broken into by the need to accompany his half-brother on a West Indies voyage (1751-52) and by the growing conflict between France and England in America.

In 1753, Washington nearly failed in a mission ordered by Gov. Robert Dinwiddie (*q.v.*), to warn French "trespassers" to leave the Virginia back country; but his report ("Account of the Success of My Proceedings") was printed and earned him a certain reputation. In the following year, Washington succeeded in driving French troops from the fork of the Allegheny and Monongahela Rivers, which he had chosen as the site of a fort, but was compelled to surrender by a larger contingent of French reinforcements. In 1755, Washington fought valiantly with the doomed Braddock expedition (see *Braddock, Edward*); and after its defeat he contrived for a time to protect a 300 m. frontier with a force of only 300 men.

Washington married the widowed Martha Custis (1732-1802), and, having inherited the Mt. Vernon estate from his half-brother Lawrence, thereafter led the life of a Virginia gentleman. He sat in the Virginia House of Burgesses, feeling imposed upon by the English factors who sold his crops and made his purchases, and increasingly aware of the restrictions which the English colonial system put on the issuance of paper money and on expansion toward the West. By 1774, his resentments had developed so far as to make him a logical delegate to the First Continental Congress, held at Philadelphia, Pa. The influence of the Massachusetts delegation in the Second Congress helped make him commander-in-chief (1775) of the forces which had gathered after the battle of Concord.

The costly attempt to hold New York (1776), as Congress had directed, made Washington determined to fight his own war on the principle of avoiding action unless compelled to it and of not allowing the enemy to compel him. He thus won time, and in 1776-77 cleared the British from New Jersey; in the next year he made a new army and used it effectively enough to convince the French that the Americans meant their Declaration of Independence and so were a good risk as allies. After Washington had used the French alliance to defeat Gen. Charles Cornwallis (*q.v.*) in 1781 at Yorktown (*q.v.*), he kept restive officers from acting against Congress in 1782 and probably saved the new republic from military dictatorship and disintegration.

Washington's interest in opening the western country and the fear for internal stability which was roused by episodes like Shays' Rebellion (see *Shays, Daniel*) helped make him active in efforts to strengthen the national government. He participated in the Annapolis Convention of Congress, where he resigned as commander-in-chief, and presided over the Constitutional Convention at Philadelphia (1787), a fact which made the new instrument more acceptable to the populace.

In New York City, on Apr. 30, 1789, Washington took the oath of office as first President of the U.S. under the Constitution. Although he attempted to put his administration above party, that proved to be impossible, for the country was sharply divided on the issues of securing financial stability, compelling the British to yield the western posts, and basing the government on the people as a whole or on the support of a privileged class. In foreign affairs, the division was reflected in attitudes toward the French Revolution. Washington accepted the financial program of Alexander Hamilton (*q.v.*) because the U.S. required a financially stable government if it were to be respected as a nation; although the Hamilton program made profits for speculators, it also strengthened the nation's credit. Washington refused to allow the French to trade upon gratitude for their help during the American Revolution. When it appeared to him that the Democratic societies which advocated the Jeffersonian program (see *Jefferson, Thomas*) of opposition to centralized government were a threat to the nation, he overrode his real distaste for public office and accepted a second term. His second term seated the Federalists firmly in power, since the party of Jefferson did not participate in the government.

Washington stabilized the nation by suppressing Indian attacks and the Whisky Insurrection (*q.v.*) against the excise laws; upheld the nation's dignity by forcing the recall of the French minister, "Citizen Genêt" (See *Genêt, Edmond*); and furthered the development of the West by securing free navigation of the Mississippi for at least a limited time (see *Jay Treaty*). Although the Jay Treaty was severely attacked, it settled the northeastern boundary. Washington swore to protect a government sketched on paper, and left it a going concern. He refused a third Presidential term, and so set a precedent which was thereafter followed until the election in 1940 of President F.D. Roosevelt (*q.v.*) for a third term. Washingon's "Farewell Address" (1796) outlined his ideals for his nation: unity among its citizens, concern for general education, good conduct as individuals and as a state, and "to steer clear of permanent alliances."

The keynote of Washington's character—and it was by his character that he held the Continental Army together and won support from Congress and the states—was devotion to duty and rigid self-discipline, for he was "most tremendous in wrath." When passions had cooled, Jefferson appraised him, stressing his prudence, penetration, integrity, and judgment that was influenced by no bias of interest, friendship, or distaste, and concluding that he was "in every sense of the word, a wise, a good, and a great man."

Washington, MARTHA, wife of George Washington, born in New Kent County, Va., May 1732; died at Mt. Vernon, May 22, 1802. She was a daughter of John Dandridge. In 1749 she married John Parke Custis, a wealthy planter. Two of their four children died in infancy and Custis died in 1757. She met George Washington about a year later and they were married in 1759. Mrs. Washington took pleasure in entertaining, was a good housekeeper, and was in close sympathy with the military and political measures of her husband. Washington visited Mt. Vernon only twice during the Revolution, but his wife accompanied him to New York and Philadelphia, and during the long winter at Valley Forge it was said of her that she "was busy from morning till night providing comforts for the sick soldiers." During his absences she managed the plantations. She was buried with her husband at Mt. Vernon.

Courtesy New York Historical Society

MARTHA WASHINGTON

Painting by Rembrandt Peale (1778-1860)

Washington, TREATY OF. See *Alabama Claims.*

Washington, UNIVERSITY OF, a coeducational state institution of higher learning at Seattle, Wash., founded in 1861. Its first class was graduated in 1876. It comprises colleges and schools of architecture, arts and sciences, business administration, dentistry, education, engineering, fisheries, forestry, law, medicine, nursing, pharmacy, social work, and graduate work. The library has more than 1,000,000 volumes. The annual student enrollment totals *ca.* 17,000, and the faculty has 1,500 members. The physical plant is valued at $60,000,000.

Washington and Lee University, a private institution of higher learning for men in Lexington, Va., founded in 1749. First known as Liberty Hall Acad., it was chartered in 1782. In 1796 its name was changed to Washington Univ., and the present name was adopted after Gen. Robert E. Lee had served as university president in 1865-70. The university comprises a college of arts and sciences, schools of commerce and administration and of law, and the Lee Journalism Foundation. The library contains more than 180,000 volumes. The annual student enrollment totals *ca.* 1,100, and the faculty has 90 members. The physical plant is valued at $5,105,305.

Washington Arch, a memorial erected in New York City to commemorate the first inauguration of George Washington as President of the U.S. It was designed by Stanford White, an architect of New York, and is located at the foot of Fifth Avenue, in Washington Square. The structure is 62 ft. wide and 77 ft. high, and the archway is 30 ft. wide and 47 ft. high. It is constructed of marble.

Washington Court House, a city in Ohio, seat of Fayette County, 75 m. N.E. of Cincinnati. The official name is Washington; "Court House" was added to avoid confusion. The city is on the Pennsylvania and other railroads and has manufactures of automotive parts and food products. It was incorporated as a city in 1831. Population, 1950, 10,560.

Washington Elm, the name given to an elm in Cambridge, Mass., situated near the northwestern corner of the Common. It is celebrated because Washington stood under this tree at the time he assumed command of the American army, on July 3, 1775. The tree died in 1923. It was replaced by a scion from its top, although this scion, and a successive one, both failed to grow. A scion was grown in Annapolis, Md.

Washington Monument. See *Washington, D.C.*

Washington State University, a coeducational, state land-grant institution of higher learning at Pullman, Wash., chartered in 1890. It comprises colleges of agriculture, engineering and mineral technology, home economics, sciences and arts, and veterinary medicine; schools of economics and business, education, pharmacy, and physical education; and a graduate school. It also has agricultural experiment stations at seven other locations in the state. The library has more than 650,000 volumes. The annual student enrollment totals *ca.* 6,000, and the faculty has some 370 members. The physical plant is valued at $45,000,000.

Washington University, a coeducational institution of higher learning at St. Louis, Mo.

Chartered as Eliot Sem. in 1853, it received its present name three years later. It includes a college of liberal arts; schools of architecture, business and public administration, dentistry, engineering, fine arts, law, medicine, nursing, and social work; and a graduate school of arts and sciences. The University Coll. is devoted principally to adult education. There are over 700,000 volumes in the library. The student enrollment numbers 6,000, and there are *ca.* 1,800 members of the faculty. The physical plant is valued at more than $28,000,000.

Washita (*wŏsh'ĭ-ta̤*) or OUACHITA, a river of the U.S., which rises near the western boundary of Arkansas and has a general course toward the southeast. It has a length of 605 m., two-thirds of which are navigable, and it joins the Black River on the northern border of Catahoula County, Louisiana. The chief tributaries are the Little Missouri, Saline, and Tensas Rivers.

Wasp (*wŏsp*), an insect belonging to the same order (*Hymenoptera*) as the bee. It differs from the bee mainly in that it has a more powerful sting, that the body is less bulky, and that it is not useful for the production of wax and honey. Wasps are divided into two general classes, the social wasps and the solitary wasps. The *solitary wasps* build small nests in the ground, or construct them of pasty material on trees or walls, and divide them into two or three cells. These cells are partly filled with food, usually with caterpillars and other insects which have been paralyzed by being stung, and afterward the food is consumed by the larvae. *Social wasps* live in communities and include males, females, and neuters or workers. The neuters and females have a venomous sting, quite similar to the sting of a hornet. Most species construct a papery nest of masticated vegetable materials, which they suspend from the branches of trees. These nests are walled peculiarly to prevent the entrance of moisture and within is a large chamber, which is reached by a tortuous gallery or passage.

In cold climates most of the adult wasps die in the winter, only a few females surviving, but a new brood is soon produced from eggs laid in the spring. Each of the surviving females finds a separate location in which to lay the eggs, thus giving rise to several distinct communities, all of them contructing new nests, instead of utilizing the old ones. Some families comprise 150 to 300 wasps, but in tropical countries the nests are frequently from 5 to 6 ft. long and contain 15,000 to 25,000 wasps. Wasps feed on the sweets of flowers and fruits and on insects, killing the latter with their jaws. Several species of wasps native to Brazil resemble bees in that they store honey.

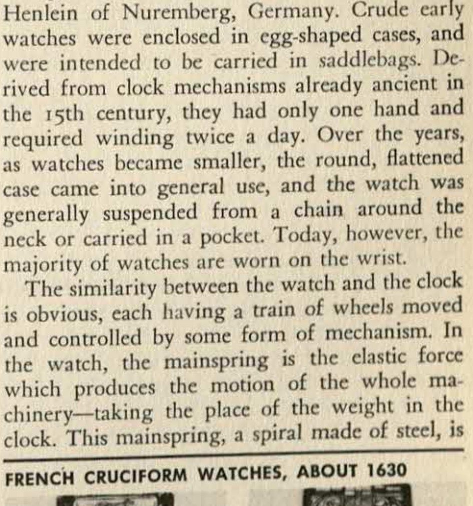
Wassermann (*väs'ẽr-män*), AUGUST VON, bacteriologist, born in Bamberg, Germany, Feb. 21, 1866; died March 16, 1925. He taught at the Univ. of Berlin (1902-13) and was made director of the Koch Institute for Infectious Diseases. He later headed a department of experimental therapy at the Kaiser Wilhelm Institute. His best known discovery (1906) is the reaction test for syphilis (*q.v.*) called the Wassermann test. .

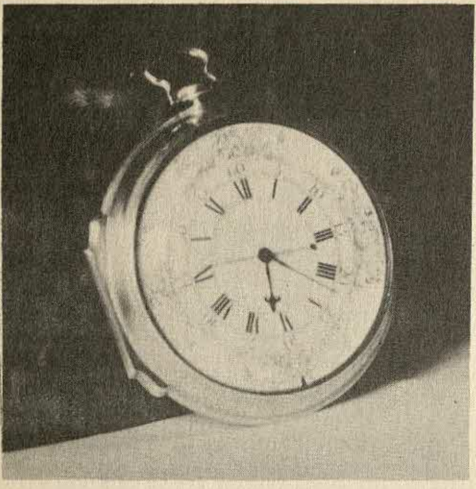
Watauga Association (*wŏ-ta̤'gȧ ȧ-sō-sĭ-ā'-shŭn*), an organization founded in 1772 to settle the territory now included in the state of Tennessee. It was formed by settlers from Virginia and North Carolina. As a means of protecting the settlement they organized a scheme of government for it, which consisted of a legislative council of 13 members, who were elected by the signers of the articles upon which the government was based. Five of the councilors had general executive authority and they chose one of their own members as supreme chairman. Many outlaws and adventurers took up their residence in the settlement, but they were not subject to the government of the association, and so the scheme did not prove satisfactory. The region became known as Washington District and in 1777 the representatives were given seats in the assembly of North Carolina.

Watch (*wŏch*), a small portable instrument for keeping and indicating time, dating from *ca.* 1510 when the first one was made by Peter Henlein of Nuremberg, Germany. Crude early watches were enclosed in egg-shaped cases, and were intended to be carried in saddlebags. Derived from clock mechanisms already ancient in the 15th century, they had only one hand and required winding twice a day. Over the years, as watches became smaller, the round, flattened case came into general use, and the watch was generally suspended from a chain around the neck or carried in a pocket. Today, however, the majority of watches are worn on the wrist.

The similarity between the watch and the clock is obvious, each having a train of wheels moved and controlled by some form of mechanism. In the watch, the mainspring is the elastic force which produces the motion of the whole machinery—taking the place of the weight in the clock. This mainspring, a spiral made of steel, is

FRENCH CRUCIFORM WATCHES, ABOUT 1630





British Official Photo

ENGLISH WATCH, 1759

wound in a cylindrical barrel; in unwinding, it moves the barrel in such a manner that motion is carried from one wheel to another by means of cogs and pinions. When it is wound up by turning the watch stem (the key, in older types), the mainspring acts upon the wheels exactly as does the weight of a clock. The balance wheel and hairspring, serving the same function as the clock's pendulum (*q.v.*), prevent running down of the mechanism and make the wheels move with uniform motion; they act upon the escapement (*q.v.*), a variously designed mechanism which serves to gauge the movement, just as the pendulum acts upon the scapewheel of the clock. Timekeeping qualities of a watch depend largely upon the escapement, as well as upon the finish of the movement, and the care given to its adjustment.

Many different kinds and sizes of watches are in use today and constructed with one of three types of escapement—the lever, the horizontal, or the chronometer. Watches in the third group are of the highest attainable precision, being rendered virtually independent of temperature variations by a compensation balance wheel and an especially delicate and effective escapement. Those used to determine the longitude of a ship at sea usually beat half-seconds and are set in gimbals, a device whereby they are kept level at all times. The various parts in watches of all grades and types are now made principally by automatic machinery. In the better grades, the movement is given an extra finishing by machines, and in the finest watches this finishing is by hand. The value is still further increased by the practice of keeping the high-priced watch in the factory for a long period of time while the movement is individually adjusted to keep perfect time. In the watches intended for mass consumption, great economy is achieved by making all the different parts interchangeable from one movement to another, thus enabling the watch repairman to replace with an exact duplicate any part which has become unfit for service.

Many improvements have been made since the first "Nuremberg egg." The hairspring, the minute hand, and the use of jewels as pivot bearings all belong to the 17th century, followed in the next 100-year period by keyless watches, the compensation balance, the duplex and chronometer escapements, the spiral balance spring, and the seconds hand. In order to minimize wear and hold oil, the bearings in modern watches are made of synthetic rubies and sapphires, which are called "jewels." Though without value as gems, these materials are nearly as hard as diamonds, and have certain characteristics which cause a drop of oil to cling to them and not run out of the watch movement. This oil, however, oxidizes in time and becomes impregnated with dirt, so that watches must be cleaned and re-oiled at periodic intervals. Small ladies' watches, for example, require frequent oiling—at least once a year. For exceptionally small watches, the interval between cleanings should be shortened to eight months. Men's strap watches need attention every 14 months, while under ordinary conditions a pocket watch may often run for two or more years without the necessity of cleaning or oiling.

Watches are now made in Switzerland, France, Germany, England, and the U.S. American manufacturers pioneered in the mass production of very low-priced watches, and these grades now account for approximately half of all the watches produced in this country. Factories specializing in these inexpensive types of watches are mostly in New England, while those making the higher-priced lines are in Waltham, Mass., Elgin, Ill., and Lancaster, Pa.

In addition to conventional wrist and pocket watches, manufactures today produce many complicated timepieces for various scientific purposes. These include stop watches with varying functions, chronographs (watches with an additional time mechanism), and split-second chronographs which enable two operations to be recorded at the same time. In the field of aviation, many special watches are used in flight calculations. Calendar watches, which in addition to timekeeping record the days of the week and the month and occasionally even give the moon's phases, date back to the early 18th century and have recently experienced a new vogue. On the other hand, repeating watches, which strike the hours and minutes and were formerly made in great numbers, are now rarely seen. Recent improvements in the watch manufacturing field include such useful devices as movements which are kept wound by merely being worn on the wrist and cases which are sealed against water and dirt, a special advantage in wrist watches, which are continually exposed to both of these damaging elements. See also *Clocks; Chronograph; Chronometer.*

Water (*wạ'tẽr*), a chemical compound having the formula H_2O in which H represents hydrogen, O oxygen. The substance has a composition of two parts by weight of hydrogen to 16 parts oxygen. Water occurs widely distributed in nature. About three-fourths of the earth's surface is covered with water in the form of rivers, lakes and oceans. Tremendous quantities of water in the form of ice are found in the polar regions, and even the air itself contains enormous quantities of water in the form of water vapor. At average summer temperatures, the air above a square mile of the earth's surface may hold 500,000 tons of water. Water is found as a prominent constituent of many minerals, ores, and chemicals, and even the bodies of plants and animals are chiefly (50 to 90 per cent) water. The human body contains about 67 per cent water. By virtue of its widespread occurrence and unique properties, water is of great importance in nature, in chemistry, and in industry.

Water is constantly passing through a continuous cycle in nature. Water vapor in the air is condensed as clouds and falls as rain, the purest form of natural water. In forming, however, the rain drops are condensed on small particles of dust and in falling, take up gases, more dust, and other impurities from the air. Rain serves the useful function of watering vegetation, but in some types of soil the soluble constituents are leached out and the soil itself eroded. The water, laden with various mineral impurities, reaches the ocean by gravity flow, and from this large reservoir the water evaporates, leaving behind its impurities and coming off as pure H_2O mixed with the air. Currents of air sweep the water vapor out over land and lower temperatures, in conjunction with impurities constituting condensation nuclei, cause the rain to form and the process to be repeated. The mineral content of the oceans is building up as a result of this process. Some water falling as rain may run in streams laden with minerals into low inland lakes and then evaporate without reaching the ocean at all. The Dead Sea, in Palestine, was formed in this way and is therefore exceedingly rich in minerals.

Water has a number of unique and useful properties. Pure water is odorless and tasteless. (The taste of ordinary water is due to dissolved impurities.) In small quantities it is also colorless, while large bodies of pure water are pale blue in color. Water is a poor conductor of electricity, and is a stable liquid at ordinary temperatures. It may be conveniently converted to a solid or gas, and since water is obtainable in relatively pure form by distillation (a process of vaporization and condensation), these properties serve as a basis for our commonly used temperature scale, unit of volume and unit of heat. On the Centigrade scale, the freezing point of water is arbitrarily given the value of 0° and the boiling point a value of 100°, while on the Fahrenheit scale the freezing point is 32° and the boiling point 212°. On the Centigrade scale there are 100 divisions called degrees (°) between the freezing and boiling points of water, while on the Fahrenheit scale there are 180°. The unit of heat called the *calorie* is the amount of heat necessary to raise one gram of water from a temperature of 14.5° C. to 15.5° C.

Water is also used in defining the fundamental unit of volume. This unit of volume is called *liter,* and is the volume occupied by one *kilogram* of water, at 4° C. Four degrees Centigrade is chosen since the density of water varies with temperature and has a *maximum* value at 4° C. Ice (0° C.) and water at temperatures greater than 4° are less dense. (The former fact is responsible for the fact that ice floats in water, and that water pipes usually burst on freezing.)

The constancy of the above properties is remarkable in view of the fact that two species of water are known. One of these is ordinary water (H_2O), while the other is called heavy water since the hydrogens therein have a mass of two instead of one. This isotope of hydrogen is called *deuterium* (D) and the formula for heavy water is D_2O. It is present to the extent of one part in every 5,000 parts of natural water, but may be isolated in a pure form. (The discovery of heavy water was made in 1932 by Professor H.C. Urey at Columbia Univ.)

Water is an excellent solvent for common chemicals, dissolving readily such substances as sugars, acids, most basic hydroxides, and salts. When solutions are formed there may be a chemical reaction with the material dissolved (solute). This is true of oxides of metals and non-metals. The oxides of the metals on reacting with water form alkaline solutions; the solutions of oxides of non-metals are acidic in nature. When some molecular substances, such as hydrogen chloride (HCl), dissolve in water they are broken down (ionized) by the water into electrically charged particles called *ions: i.e.,* $HCl + H_2O \rightarrow H_3O^+ + Cl^-$.

The presence of water may cause a more efficient contact between reactants and thus promote a reaction. This is the case when gaseous sulfur dioxide is mixed with gaseous hydrogen sulfide. As long as the two are *dry* the reaction appears to be very, very slow, but if water is added, the reaction proceeds so rapidly that it is completed in a very few minutes. Water is in this sort of case said to be a *catalyst,* since it speeds up the reaction without being used up.

Water is formed in the oxidation or combustion of any hydrogen-containing compounds, such as gasoline, petroleum products in general, and hydrogen gas. Likewise, water is formed by reduction of oxides of metals such as copper oxide (CuO) with hydrogen. Hydrogen and oxygen, the constituents of water, may remain mixed with one another indefinitely without reacting, but if ignited, an explosion occurs in which water is the product formed.

From an industrial standpoint, water is used primarily for the generation of steam and for laundering. Naturally occurring waters to be used for these purposes must usually be chemically treated since they contain objectionable impurities. In the generation of steam the impurities remain as a scale, decreasing the efficiency of the boiler and rendering it liable to explosion, while in laundering the presence of magnesium, aluminum, iron, and calcium salts prevent the lathering of the soap and may be precipitated by the latter, staining or discoloring the fabric. Water containing the above impurities is called *hard water*. When these substances are removed the water is said to become "soft." This may be accomplished by boiling if the water contains the bicarbonates of the metals; such water is called "temporary hard water." If chemical treatment is required to soften the water it is said to be "permanent hard water." Hardness may be removed by treatment with sodium carbonate or filtration through Zeolite (a special type of sand).

For drinking purposes, water should be free of odors, objectionable tastes, and bacteria. The clarity of water, lack of odor or taste, is no proof of absence of bacteria. Odors and tastes may be removed from water by addition of powdered charcoal and/or filtration through beds of gravel and sand. The bacteria are removed by treatment with chlorine or bromine or in some cases by irradiation with ultraviolet light. Algae may be destroyed by additions of small amounts of copper sulfate (blue vitriol).

Water Buck (*wạ'tẽr bŭk̦*), a large East African antelope with coarse brownish fur. It lives near rivers.

Water Bug (*wạ'tẽr bŭg*), the general name of any insect which lives almost entirely in water and feeds on other aquatic insects. Nearly all of these insects are active and move about in or on the water by means of oarlike hind legs. The color is brownish, the first pair of wings is horny, and the antennae are small. The head is small and the fore limbs are prehensile. They include the *water-boatman*, the *back-swimmers*, the *marsh-treaders*, the *water-striders*, and the *creeping water bugs*. Several allied species of insects are known as *water scorpions*. They are quite large, some species being 2 to 3 in. long, and are frequently seen flying about at night in search of food. In habits they are voracious and carnivorous. Two long filaments extend from the caudal extremity, though which respiration is effected.

Waterbury (*wạ'tẽr-bẽr-ĭ*), a city in west central Connecticut, in New Haven County, on the Naugatuck River, *ca.* 20 m. N. of New Haven. It is served by the New York, New Haven & Hartford R.R. With an area of 28 sq. m., the city devotes 803 acres to 43 parks. It is the seat of a branch of the Univ. of Connecticut and of the Mattatuck Historical Society. A point of interest is the Village on Pine Hill, a replica of Bethlehem.

Primarily an industrial community, Waterbury is known for its brass and copper products, clocks, and watches. Other manufactures include aluminum, eyelet and screw machine products, plastics, and electronics. The surrounding area produces fruit, poultry, and dairy products. In 1958 the city had a value added by manufacture of $173,347,000. It is the center of the Waterbury Standard Metropolitan Statistical Area (1960 pop., 181,638), which includes parts of New Haven and Litchfield counties.

The community was founded in 1674 as the plantation of Mattatuck. In 1686 it was incorporated as the village of Waterbury. The city was incorporated in 1853.

In 1900 Waterbury had a population of 45,859. Its period of greatest growth was the decade between 1900 and 1910, which saw an increase to 73,141. In 1950 the population was 104,477; in 1960, 107,130.

Water Colors (*wạ'tẽr k̦ŭl'ẽrz*), the general name of pigments used in painting, which are mixed with water and some adhesive, as size or gum, instead of oil. Colors of this class are prepared in various ways to suit the method of application. Those employed in coloring walls and similar surfaces are mixed with size or glue, while those used in painting pictures are made in the form of small cakes. In painting with water colors the artist uses a number of small brushes and several cakes of different colors. Water colors are not only clearer, but they dry more rapidly than oil paintings. Among the colors used chiefly are indigo, gamboge, cobalt blue, lake, carmine, vermilion, burnt ocher, pink, red, and ultramarine. They are usually mixed with water alone, but gum and other substances are sometimes added to the water, in order to give depth to the shadows and brilliancy to the lights.

Water Cress (*wạ'tẽr k̦rĕs*), an aquatic perennial, a species of the mustard family, largely cultivated in Europe and the U.S. It is used in salad and as seasoning.

Waterfall (*wạ'tẽr-fạl*), or CATARACT, a descent of the water of a river or stream over a precipice or down a steep incline. Waterfalls occur most frequently in mountainous countries, where the streams from the mountain sides enter the valleys. Rocky channels and sides are necessary to form an enduring waterfall, as otherwise the break in the channel is soon worn down to a common slope. In most cases the volume of water is comparatively insignificant, but in some instances the fall is very great and the phenomenon is correspondingly grand. These falls are of much importance for the power obtained for manufacturing and other industrial purposes.

Yosemite Falls of California are the highest in the U.S., falling 2,660 ft. by three plunges. The highest waterfall in the world is Angel Falls in Venezuela, descending 3,300 ft.

Waterfalls constantly recede, the rate depending upon the hardness of the rock. The causes of this action may be seen in the illustration, which gives a view of the different strata of earth which usually compose the ledges over which the water descends. It will be observed that the direct action of the water is greatly aided in the erosion by reaction after the main current strikes the bottom. It is estimated that Niagara Falls recedes up the stream one foot per year. Some of the waterfalls present splendid scenery. This is true of the Yosemite Falls, which is one of the most beautiful in the world. The most noted cascade of the Mississippi valley is formed by the Falls of Minnehaha, near Mineapolis, Minn. It was made famous by Longfellow's poem, "Hiawatha."

FAMOUS WATERFALLS OF THE WORLD

WATERFALL	LOCATION	HEIGHT (FT.)
	Africa	
Tugela	Natal	1,800
Victoria	Rhodesia	343
	Asia	
Gersoppa	India	830
Kudaki	Japan	270
	Europe	
Gavarnie	France	1,385
Trummelbach	Switzerland	950
	North America	
Ribbon	California	1,612
Upper Yosemite	California	1,430
Multnomah	Oregon	850
Bridalveil	California	620
Nevada	California	594
Lower Yellowstone	Wyoming	308
Taughannock	New York	215
Niagara	New York-Ontario	167
	South America	
Angel	Venezuela	3,300
Kukeman	British Guiana	2,100
	Islands	
Sutherland	New Zealand	1,904

Water Glass (*wạ'tẽr glăs*), or SOLUBLE GLASS, the name given to any one of several alkaline silicates which contain a sufficient proportion of alkalies to render them soluble in water. Some substances of this class, such as Fuchs's soluble glass, are ordinarily insoluble in water, but will dissolve in boiling water. They are sirupy, transparent, and colorless and have a specific gravity of not less than 1.25. They are used for coating to preserve frescoes, the process being known as *stereochromy*, and their value consists in rendering the surface fireproof and waterproof. Other uses consist in the manufacture of certain soaps, earthenware, and artificial stone. In a modified form they are employed in the dyeing and printing of fabrics.

Courtesy Union of South Africa, Info. Bureau, N. Y.

VICTORIA FALLS, RHODESIA

Waterhouse (*wạ'tẽr-hous*), ALFRED, architect, born in Liverpool, England, July 19, 1830; died in 1905. He studied in Manchester and traveled in Italy. Later he prepared designs for the Manchester Assize Courts, which were selected after a competitive test. He made drawings for the city hall and Owens Coll., in Manchester, and prepared designs for the Royal Infirmary at Liverpool. His works in London include the National Liberal Club, the City and Guilds' Institute, and the St. Paul's Schools. In 1885 he was made a member of the Royal Acad. He received many medals and other awards from various associations. The Gothic style is a prominent feature of his designs.

Water Lily (*wạ'tẽr lĭl'ȳ*), the common name of various plants resembling the true lily. They differ from the latter in that they are endogenous, that is, growing from within. On the other hand, true lilies are exogenous, that is, growing by external additions. About 20 species of water lilies are widely distributed in the lakes and rivers of the Temperate and Torrid Zones. The fleshy rootstocks send rootlets down in the mud and long, cylindrical leafstalks grow upward, with circular

NAPOLEON AT THE BATTLE OF WATERLOO

Painting by Karl Wilhelm von Steuben (1788-1856)

or cordate leaves usually floating on the surface of the water. Beautiful, solitary flowers, principally white, blue, or red, are borne on long cylindrical stalks and rise just above or float on the water. The *Victoria Regia,* native to the Amazon valley, is the largest water lily, its leaves ranging from 3 to 6 ft. in width. The *sweet-scented water lily* is the best known plant of this class in North America. The *blue lotus* and the *white lotus* are water lilies native to the Nile. They bear pleasantly scented flowers and are cultivated extensively in hothouses. Some have blooms ranging in diameter from 6 to 12 in., but they are somewhat smaller when cultivated in gardens.

Waterloo (*wa̤-tẽr-lōō'*), county seat of Black Hawk County, Iowa, located on the Cedar River, 90 m. w. of Dubuque, and 272 m. w. of Chicago. It is served by the Chicago, Rock Island & Pacific, the Chicago Great Western, the Illinois Central, and the Waterloo, Cedar Falls & Northern R.R.'s, and a municipal airport. It is surrounded by a rich farming, livestock, and dairy region. Noteworthy among its buildings is the Boulder Church, built of rock from a single granite boulder. Chief industries are meat packing and soybean processing. Other manufactures include farm implements, textiles, machinery, boxes, flour, and tractors. Of major importance is the Iowa Dairy Cattle Congress, held in Waterloo, to which breeders in the U.S. and Canada send their cattle. Waterloo was incorporated in 1906. Population, 1950, 65,198.

Waterloo, a town (population 6,000) of Belgium, in the province of Brabant, about 12 m. s. of Brussels. It is famous as the scene of the battle of June 18, 1815, in which the French army under Napoleon was defeated by the allied forces under Gebhard von Blücher and the Duke of Wellington (*qq.v.*). The Allied army consisted of about 93,000 men, of whom 25,000 were British troops; this army had been defeated by Ney at Quatre-Bras on June 16. They had maintained enough order to regroup at Waterloo to await the arrival of Blücher's Prussian army of about 116,000 men, previously defeated at Ligny by Napoleon. Napoleon, with a select group of about 70,000 trained veterans, hoped to defeat the British before the German army could reach Waterloo. Wellington, however, aimed to hold his position until Blücher's army could arrive, at which time he planned to make a combined assault upon the French.

Napoleon's forces began the battle about noon and continued the attack with great vigor until evening. They were on the point of winning the contest when Blücher came to the rescue with the German army and turned the tide of battle by hemming the French in between the allied armies. As a last resort, the Old Guard, constituted of the veterans from the Imperial Guard, charged upon the allied forces with remarkable persistence, but they were either cut to pieces or compelled to retreat, and Blücher was soon in vigorous pursuit of the retreating French. Estimates place the French losses at 42,000 and those of the allied armies at 23,000. This famous engagement accomplished the final downfall of Napoleon, and from it the expression, "To meet one's Waterloo," has become proverbial.

Watermark (*wa̤'tẽr-märk*), a characteristic design impressed upon sheet paper during fabrication. The custom is believed to have originated in Italy during the 13th century, when twisted wire molds were pressed against the moist pulp to alter the construction of the fibers. Watermarking of handmade paper still requires the use of wire molds which give a clearer impression than is obtainable by the techniques employed in machine-made paper. Watermarking has lost much of its old significance, and is used today chiefly to trademark quality papers. See also *Paper.*

Watermelon (*wa̤'tẽr-mĕl-ŭn*). See *Melon.*

Water Meter (*wa̤'tẽr mēt'ẽr*), a mechanism for measuring and recording the quantity of water or other liquid flowing through a pipe. The water meter in general use contains a chamber of spherical form, so constructed that water may flow freely through it by means of the entrance and delivery pipes. Within the chamber is a tightly fitting disk, mounted on a ball-and-socket bearing, which revolves under a slight pressure of water, and the flow of the liquid is measured with every turn of the disk. A recording device, consisting of a wheelwork, is connected with the disk, so that the number of revolutions made is shown by the dials. Some meters register the pressure and thus afford data for a calculation of the flow of water, but these are not in extensive use. Water meters are employed in most systems of waterworks, each consumer having one of these mechanisms to determine the quantity of water used.

Water Moccasin (*wa̤'tẽr mŏk'ȧ-sĭn*), a poisonous snake sometimes 4 ft. in length, of greenish-black color. It is at home in rivers and swamps of the Atlantic and Gulf coasts, Florida and the Mississippi valley.

Water Plantains (*wa̤'tẽr plăn'tĭnz*), a genus of semi-aquatic or aquatic herbs with white flowers and often with floating leaves.

Water Polo (*wa̤'tẽr pō'lō*), a ball game played by swimmers, in open water or in a pool. The game somewhat resembles hockey, but the large round ball is filled with air and floats upon the surface. An even number of players take part in the game, each side attempting to advance the ball by throwing it or pushing it to the goal line of the opposing side. Water polo figures prominently in Olympic competition.

Water Power (*wa̤'tẽr pou'ẽr*). See *Dams; Generator; Hydraulics; Waterfall; Waterworks.*

Waterproofing (*wa̤'tẽr-pro͞of'ĭng*), the practice of making materials and structures shed water without absorbing any of it. Water repellence means that a surface sheds water though it is not necessarily waterproof; for example, leather shoes, for ideal comfort in all kinds of weather, should shed liquid water (be water repellent), but should permit the evaporation of perspiration from the feet (not be waterproof). Moisture repellence means that condensed moisture must be shed, and that a moisture film (as that which may occur on high-tension electrical insulators) must be prevented from forming on the surface.

Waterproofing may be applied to keep water out of, or within, objects. It is generally achieved by one of two methods: (*1*) A film or layer of waterproof substance is applied to the surface of the material to be protected; or (*2*) waterproofing substances may be forced into porous materials. Among materials frequently waterproofed are stone, brick and ceramics, concrete, wood, leather, and textiles. All of these substances are porous to a certain degree, though the sizes and types of their pores vary widely. Hard substances such as stone (including marble) and brick, because of their rigid structure and tiny pores, admit only a small amount of water, which may be evaporated on the unexposed side. These construction materials are often waterproofed, however, to avoid dampness in the structure, or to protect the materials from chipping or eroding when retained water freezes in their pores. Wood is often waterproofed to prevent decay, as water within wood fiber tends to foster the growth of decay organisms.

The substances used for waterproofing vary according to the type of material on which they are to be used. Such substances include the bitumens (asphalt and tar products), rubber, oils, fats, waxes, metallic soaps, silicons, natural or synthetic resins, and very fine inert powders. Some of these are used in the liquid or molten state, others as solutions in various kinds of solvents, some as emulsions or suspensions in water.

Application of waterproofing substances may be made by brush, by spray, by immersion with or without vacuum and/or pressure, and by other means. Impregnating solutions are used to deposit waterproofing solids in the pores of a structure or material. Sometimes two-bath processes are used for the purpose of forming a waterproof solid in the pores of the material under treatment. One such process consists of dipping the material (such as a fabric) in a soap solution (usually sodium stearate) and then dipping it in a solution of an aluminum compound, which forms aluminum stearate, a waterproofing substance. Solutions of resins, waxes, or bitumens dissolved in a solvent may also be used for coating or impregnation. When the solvent evaporates, solid particles are left in the pores of the material so that water cannot penetrate it. Coating compounds are substances which form a waterproof film over the surface of a material. Emulsions may have the properties of both impregnating and coating compounds. Membrane waterproofing consists of placing a waterproof layer between layers of the material to be waterproofed, as a layer of rubber between layers of cloth in a mackintosh (a form of raincoat first made in Scotland), or tar paper and asphalt between old and new concrete to protect building foundations against the entrance of ground water. Integral waterproofing consists of adding waterproofing ingredients to materials before the final product is fabricated. Thus certain ingredients may be added to Portland cement to increase the watertightness of concrete.

Water Purification (*wa̤'tẽr pūr-ĭ-fĭ-kā'shŭn*). See *Water; Waterworks.*

Water Rights (*wa̤'tẽr rīts*). See *Riparian Rights.*

Water Spider (*wa̤'tẽr spī'dẽr*), a European spider which constructs a bag of silk, with the opening at the bottom, and lives in it under water, as in a diving bell. The bag is kept filled with air which the spider carries down from the surface, one bubble at a time. The name water spider is also applied to some of the wolf spiders that live near the edge of streams and sometimes dive into the water, and to almost any small, long-legged crustacean, mite, or insect seen walking over the water.

Waterspout (*wa̤'tẽr-spout*), a phenomenon common to certain regions of the sea, due to the action of whirlwinds or tornadoes. It usually consists of a whirling column of water, extending from the surface of a lake or ocean to the cloud above. Waterspouts originate from the rapid condensation of vapor that takes place, owing to the different temperatures of opposite winds and to the rarefaction produced in the currents of revolving air. In many cases portions of the clouds descend and whirl in the form of a funnel-shaped mass. The whirl may draw a column of spray from the surface of the sea, which it unites with the mass above, and may move as an immense pillar over the surface. In fairly calm weather the waterspouts have a vertical position, while winds bring them into a position oblique to the horizon. Waterspouts, whirlwinds, dust clouds, and tornadoes are essentially the same, varying mainly in dimensions, intensity, quantity of moisture, or degree of visible vapor. See also *Storms; Whirlwind; Wind.*

Water Strider (*wạ'tēr strī'dēr*), rapidly moving aquatic insect belonging to the Gerridae family. It is slender, with long legs. It prefers quiet waters, and hibernates in mud, under stones, or leaves. A common species in the U.S., it is about half an inch long.

Watertown (*wạ'tēr-toun*), county seat of Jefferson County, New York, on the Black River, 68 m. N. of Syracuse, and on the New York Central R.R. The city has a number of industries, and is the trading center for the Thousand Islands and western Adirondack resorts. Among the noteworthy buildings are the Woolworth Building on the site of the original 5 and 10 cent store, the Jefferson County Historical Museum, the Henry Keep Home for the Aged, and the Flower Memorial Library, erected in memory of a former governor of New York. Watertown was settled in 1800, became the county seat in 1805, and was incorporated as a city in 1869. Population, 1940, 33,385; in 1950, 34,350.

Watertown, a city in Middlesex County, Massachusetts, situated on the Charles River, 7 m. W. of Boston, and on the Boston & Maine R.R. The manufactures include rubber shoes, men's clothing, paint, precision tools, machinery, truck bodies, pharmaceuticals, fluorescent lighting equipment, and food products. Among the noteworthy buildings are the Perkins Institution and Massachusetts' School for the Blind, the Abraham Browne house (built in 1663), and Coolidge Tavern, owned by ancestors of Calvin Coolidge, where George Washington spent some time in 1780. A U.S. Arsenal is also located here. Watertown, incorporated in 1630, was the seat of a Provincial Congress in 1775. Population, 1950, 37,329.

Watertown, county seat of Codington County, South Dakota, 98 m. N. of Sioux Falls. It is near the source of the Sioux River and on the Great Northern, the Chicago & North Western, the Chicago, Rock Island & Pacific, and the Minneapolis & St. Louis R.R.'s. The surrounding country is fertile. Lake Kampeska and Lake Pelican are nearby. The city is very popular with hunters, who find many game birds in the vicinity of the town. The industries include poultry and meat packing plants, creameries, milling, bottling, and a large trade in farm machinery. It has a large trade in potatoes, flax, all small grain, livestock, and auto supplies. The town was incorporated in 1885. Population, 1950, 12,699.

Watertown, a city at the boundary between Dodge and Jefferson Counties, Wisconsin, on the Rock River, 35 m. E. of Madison. Transportation is furnished by the Chicago & North Western and the Milwaukee R.R.'s. The city is surrounded by a fertile farming and dairying country, and enjoys a large retail trade in merchandise. Among the manufactures are shoes, woodwork, iron and foundry products, dresses, and automatic cashiers. Watertown is the seat of Northwestern Coll., a Lutheran institution founded in 1865, with a current student enrollment of about 150. The city is the site of the first kindergarten in America, established in 1855, by the wife of Carl Schurz (*q.v.*). The building is now a feature of the city. Watertown was founded in 1834 and was incorporated as a city in 1853. Population, 1950, 12,417.

Waterville (*wạ'tēr-vĭl*), a city in Kennebec County, Maine, on the Kennebec River, 18 m. N.E. of Augusta. It is on the Maine Central R.R. and on Ticonic Falls, which supply water power. Waterville is the seat of Colby Coll., founded in 1818 as Waterville Coll., with a current student enrollment of *ca.* 1,000. Chief manufactures are stoves, engines, brick, shirts, machinery, clothing, textiles, paper and pulp products, plastics, and toys. The place was settled in 1760, but was a part of Winslow until 1802. It was chartered as a city in 1888. Population, 1950, 18,287.

Watervliet (*wạ-tēr-vlēt'*), a city in Albany County, New York, situated on the Hudson River, 150 m. N. of New York City. It is served by the Delaware & Hudson R.R. Noteworthy buildings are the U.S. arsenal and the Schuyler Homestead where Gen. Philip Schuyler (*q.v.*) lived. The city trades in agricultural produce. Among the manufactures are bells, sashes, blinds, ladders, guns, cannon, spun silk, spirit levels, brushes, sandpaper, plastics, paints, and machinery. Watervliet was incorporated in 1836 as West Troy, but was renamed and incorporated in 1896. Population, 1950, 15,197.

Water Wheel (*wạ'tēr hwēl*). See *Hydraulic Turbine; Rotor; Wheel.*

Waterworks (*wạ'tēr-wûrks*), a mechanical system contrived to supply and distribute water to communities where abundance of pure water is vital. Very small settlements and many individual households, especially in rural areas, may rely upon rain barrels, nearby springs, or their own wells, but larger communities requiring a steady and plentiful water supply must procure it by more elaborate means. If no suitable lake or river is available, water is usually collected from a natural watershed in some outlying area and piped to a small lake—wholly or partly artificial—designed especially for water storage and accordingly protected from contamination. From this lake, called a reservoir, the water is distributed to large local water mains, and then through smaller pipes to the individual users. In small communities, and in districts too far from a natural watershed, deep municipal-owned wells and storage tanks provide the water supply.

Underground pipe lines of steel, cast or spun iron, asbestos cement, or concrete have replaced the old-fashioned bored-wood or lead conduits, as well as the still earlier masonry aqueducts (*q.v.*) and open canals, formerly used to conduct water from watershed to reservoir. When the source of the water supply is at a higher level than its destination, the force of gravity will carry it as far as the community mains, with additional power required only for local distribution purposes. However, to assure adequate water pressure, centrifugal pumps driven by steam turbines or electric motors are in general use. Internal-combustion engines (diesel or gasoline) are also called upon for emergencies, and used for less extensive work in smaller communities. A municipal waterworks system usually provides purified water for drinking purposes, as well as a ready supply of water (and adequate pressure) for all household and industrial uses, and for the important civic tasks of fire-fighting by means of hydrants and sprinklers in buildings, and sanitation by means of sewers, street-flushing, etc.

The purification of water which has accompanied the development of modern waterworks systems has proved a highly effective health measure. Typhoid fever furnishes an example, with a contemporary record (in the U.S.) of only one-half of one per cent of the number of cases reported in 1900. Aeration and the early superficial use of gravel, charcoal, sponge, or slow sand filters have been largely supplanted by two methods: chlorination (introduction of a small, controlled quantity of chlorine into the water), and filtering in mechanical filtration plants. Further, various processes of "softening" water by removal of mineral salts are used in regions where an excess of mineral content makes the water "hard" and soap-lathering difficult. Steps have also been taken in some places to lower the laxative mineral content of the water, and even to improve its taste and odor. More than 5,000 water-treatment plants throughout the U.S. now provide daily *ca.* 7,000,000,000 gallons of purified water.

The earliest water supply system in the U.S. dates from about 1732 and was operated in Schaefferstown, Pa., although the first water-supply engineer mentioned in historical records is a Danish immigrant named Hans Christofer Christiansen. After a long period of "severe struggles" lasting from 1754 to 1761, he finally succeeded in establishing the Bethlehem, Pa., waterworks, complete with the first American pumping system. In 1801, the earliest large pumping plant in the U.S. was installed at Philadelphia. By 1885, there were 1,000 municipal waterworks in the country. Today more than 13,000 public waterworks systems, representing an investment of over $5,000,000,000, distribute annually 12,500,000,000 tons of water. The average U.S. city utilizes some 133 gallons of this water per day for each person served; this figure is, of course, raised by the extraordinary water requirements of many industrial plants. There are usually about 100 customers or services to each mile of pipe, and for every 1,000 persons served, 300 tons of pipes, valves, and hydrants are required, with 10 tons of service pipes and meters. The surprisingly low cost of maintaining a water supply system is borne by the community, which primarily defrays expenses by metering the quantity of water supplied to each consumer-customer and billing him in proportion.

Another type of waterworks is that developed solely for agricultural and industrial purposes. Fertilization of semiarid areas, for example, has been made possible by a system of artificial *irrigation* (*q.v.*) dependent upon the transportation of large amounts of water from a distance. Where waterfalls exist, or where dams (*q.v.*) can be easily constructed, municipal or industrial waterworks installations can often be linked up with a water-power system for the production of electricity; *hydraulics* (*q.v.*) is the term applied to this harnessing of hydrodynamic energy. In recent years, the use of both artificial irrigation and electricity generated from water power has been greatly extended in this country.

Water power is the name given to the energy created by the force of moving water—actually the force of gravity operating through the weight of the water as it falls. As with wind power, the simplest forms of water power were recognized and used early in industrial history. From the first crude dams and wheels, placed at strategic points to utilize power from rivers and waterfalls, more elaborate systems were gradually evolved. Cascades of water from dams built in series, systems of canals where more wheels could be accommodated, development of turbines—all were preliminary to the tremendous strides made by modern engineering in utilizing water power to promote manufacturing, transportation, and hydroelectric enterprises. Under the Federal Power Commission, created by Congress in 1920 for investigation of water-power potentialities, and later given enlarged powers to include hydroelectric projects as well as water power, vast enterprises such as the Tennessee Valley Authority (*q.v.*) have been developed.

Watkins Glen (*wŏt′kĭnz glĕn*), a resort village, county seat of Schuyler County, New York, located 18 m. N. of Elmira, at the south end of Seneca Lake, is served by the Erie, New York Central, and other railroads. Watkins Glen State Park (*q.v.*), a resort area of scenic beauty, is located here. Nearby brine wells provide raw material for manufacturing salt. First settled in 1788, Watkins Glen was incorporated in 1842 as Jefferson and ten years was renamed Watkins after an early settler. Its present name dates from 1928. Population, 1950, 3,052.

Watkins Glen State Park, partly located in Watkins Glen, N.Y., near Lake Seneca, 20 m. N. of Elmira. A ravine noted for its picturesque scenery and great beauty, the state park of some 800 acres was formed in 1906. Outstanding feature of the park is the gorge, in some places 300 ft. deep and extending for almost 2 m. The walls of the gorge are of Devonian shale, which, during the Pleistocene period, were cut into their present shape by great sheets of glacial ice. The walls of the gorge are frequently referred to as the Painted Rocks, deriving that name from the Indian pictures painted upon them. The narrow stream which flows through the gorge forms a succession of beautiful cascades and rapids. Outstanding among these are Chequaga Falls and Central, Caverna, and Cathedral cascades.

Watson (*wŏt′s′n*), JAMES CRAIG, astronomer, born in Fingal, Canada, Jan. 28, 1838; died in Madison, Wis., Nov. 23, 1880. He was born while his parents were visiting in Canada. In 1857 he was graduated from the Univ. of Michigan, where he learned the art of grinding lenses. He became a professor of astronomy and director of the observatory of that institution, in 1863, and obtained a like position at the Univ. of Wisconsin in 1879. Watson discovered 23 asteroids, among them Io, Minerva, and Aurora. In 1870 he went to Sicily to witness an eclipse of the sun. He had charge of a company that observed the transit of Venus at Peking, China, in 1874, and was one of the judges at the Philadelphia Centennial Exposition in 1876. The government employed him in 1878 to observe a total solar eclipse in Wyoming. His writings include: "Theoretical Astronomy," "Popular Treatise on Comets," and "Tables for Calculating Simple and Compound Interest and Discount."

Watson, JOHN, author and clergyman, known as *Ian Maclaren,* born in Manningtree, England, in 1850; died in 1907. He was descended from Scotch parents who settled at Perth, Scotland, in 1854. In 1870 he was graduated from the Univ. of Edinburgh and afterward studied theology at Tübingen, Germany. He first served as pastor of a Free Church congregation in Logiealmond, Scotland, a straggling village that furnished many of the striking features of his stories. He became pastor in Glasgow in 1877 and at Liverpool in 1880. His first writings appeared in the *British Weekly* and were afterward published in a volume called "Beside the Bonnie Brier Bush." Watson made several successful lecture tours in Canada and the U.S. His later writings include: "The Days of Auld Lang Syne," "A Doctor of the Old School," "Kate Carnegie," and "The Mind of the Master."

Watson, JOHN BROADUS, psychologist, born in Greenville, S.C., Jan. 9, 1878; died in New York, N.Y., Sept. 25, 1958. He received his education at Furman Univ. and the Univ. of Chicago (Ph.D., 1903). He taught experimental psychology at the Univ. of Chicago in 1903-08 and was professor and director of the psychological laboratory at Johns Hopkins Univ. in 1908-20. Turning to the field of commercial advertising, he was with the Stanley Resor agency (1920-24), then vice president of the J. Walter Thompson Co. agency (1924-36), and vice president of the William Esty & Co. agency until he retired (1945).

Watson was the leading exponent of the behaviorist school of psychology (see *Behaviorism*), which believes that human behavior is a result of the interaction of stimulus and automatic response and that, like any other purely scientific phenomenon, any reaction to any given stimulus can be predicted. Only fear, love, and rage, he contended, were natural responses. Watson was editor of the *Psychological Review* (1908-15) and of the *Journal of Experimental Psychology* (1915-27). The author of many books, he wrote "Animal Education" (1903), "Behavior" (1914), "Behaviorism" (1925), "Ways of Behaviorism" (1928), and "Psychological Care of the Infant and Child" (1928).

Watson, JOHN CRITTENDEN, naval officer, born at Frankfort, Ky., Aug. 24, 1842; died Dec. 14, 1923. He attended the U.S. Naval Acad., became a master in the navy in 1861, and saw service in the Civil War at Fts. Jackson and St. Philip. In 1862 he took part in the attack upon Vicksburg and the following year served in the Battle of Mobile Bay, where he was wounded. In 1898 he commanded the blockading squadron on the northern coast of Cuba, and the following year was made commander-in-chief of the naval forces at the Asiatic station. He was made president of the naval retiring board in 1902 and served as special representative at the coronation of Edward VII.

Watson, THOMAS EDWARD, politician and journalist, born in Columbia County, Georgia, Sept. 5, 1856; died Sept. 26, 1922. He studied in the public schools and at Mercer Univ., Macon, Ga., but a lack of means compelled him to leave that institution before being graduated. He studied law and was admitted to the bar. He was elected to the state legislature as a Democrat in 1882 and in 1890 became a member of Congress. The People's party nominated him for Vice President in

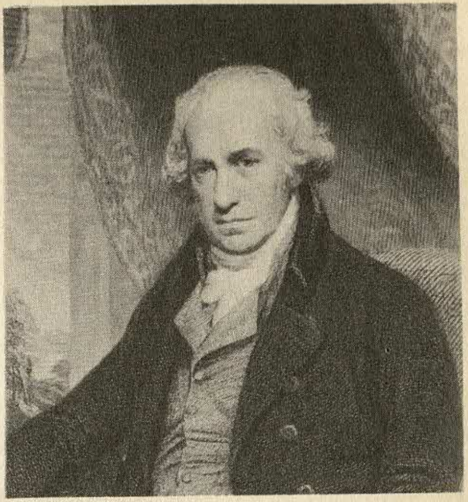
1896, when he received 27 electoral votes for that office, while Sewall received 149 and Hobart received 271. He established *Tom Watson's Magazine* in New York City in 1905, but resigned as editor the following year. In two general elections, those of 1904 and 1908, he was candidate for President on the Populist ticket, but did not receive any electoral votes. He published: "History of France," "Life of Thomas Jefferson," and "Life of Napoleon."

Watson, THOMAS JOHN, industrialist, born in Campbell, N.Y., Feb. 17, 1874; died in New York City, June 19, 1956. He was educated at the Addison (N.Y.) Acad. and the Elmira School of Commerce. He joined the National Cash Register Co. in 1898, rising to general sales manager by 1913. He became director and president of the company later known as the International Business Machines Corp. in 1914. As such, Watson was an outstanding industrialist, noted for his emphasis on sales methods. His use of maxims led to widespread popularization of his office slogan, "Think." He was decorated by several governments for his services on behalf of world trade. One of the best paid executives of the U.S., Watson supported many philanthropies, among them the promotion of American art and the encouragement of religious education.

Watson-Watt (*wŏt's'n-wŏt*), SIR ROBERT ALEXANDER, physicist, born in Brechin, Scotland, April 13, 1892. He was educated at the University Coll., Dundee, of the Univ. of St. Andrews, where he later taught (1912-21). As a meteorologist and radio expert for the air service during World War I, he began the work on radiolocation devices which resulted in the British radar (*q.v.*) systems of World War II. He patented his first such device in 1919. He was later superintendent of the radio department of the National Physical Laboratory (1933-36) and director of communications development for the air ministry (1938-40). Watson-Watt, knighted in 1942, devoted his time to business interests in Great Britain and Canada after 1952.

Watt (*wŏt*). See *Electricity*.

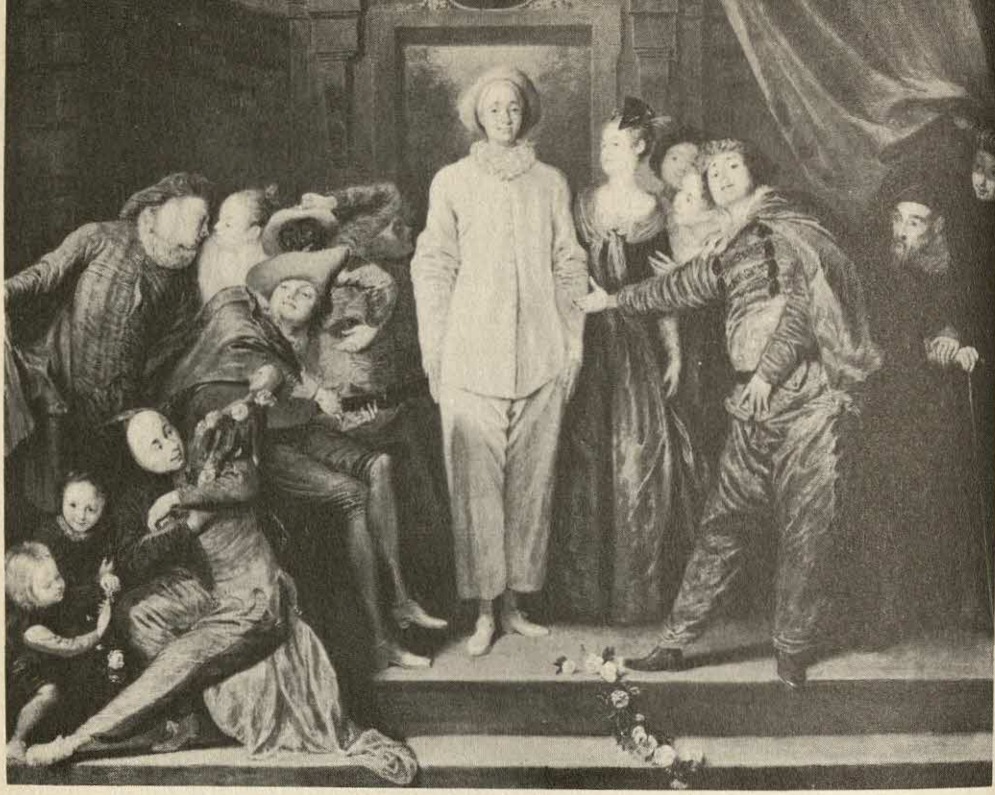
Watt, JAMES, inventor, born in Greenock, Scotland, Jan. 19, 1736; died Aug. 25, 1819. He was the son of a merchant and magistrate of Greenock, where he studied in the public schools. In 1755 he went to London to learn the business of a scientific instrument maker. He also mended fiddles and other musical instruments. He became instrument maker to the Univ. of Glasgow, in 1757, remaining there until 1763, when he was appointed a civil engineer. He surveyed for a commission that promoted a number of canals and harbor improvements. In the meantime he invented the micrometer, an instrument for measuring various small angles or dimensions, which is generally used in connection with a microscope or telescope. However, the invention that made the name of Watt famous is the modern condensing steam engine. There is a pleasant but dubious legend that he discovered the power of steam by observing its effects in passing from a teakettle. Though the steam engine had been employed before his time, it was an awkward and wasteful machine and could be used only in pumping at a slow rate.



JAMES WATT

The invention of Watt adapted the steam engine to the purpose of driving machinery. Although this device has since been improved by a large number of inventors, the original machine employed the same principles which are now utilized. In 1774 he associated himself with Matthew Boulton, at Soho, near Birmingham, England, where large numbers of steam engines were manufactured. He retired from business in 1800 and conveyed his manufacturing interests to his son, James Watt (1769-1848). The later years of his life he spent at his home near Birmingham, where he invented or improved a number of mechanical appliances, including a press for copying. Watt was made a member of the National Institute of France and a fellow of the Royal Society of London. The Univ. of Glasgow gave him an honorary degree in 1806, and a monument was erected to his memory in 1824.

Watteau (*vȧ-tō'*), JEAN ANTOINE, painter, born in Valenciennes, France, in 1684; died in Paris in 1721. He moved to Paris while still a youth. Here he made the acquaintance of Claude Gillot, with whom he worked on the latter's allegorical decorations and lively fantastic drawings. Work with interior decorators (Claude Audran, the decorator of the Luxembourg Palace, and others) followed. Soon, however, Watteau established his own fame as a painter, and as early as 1717 he became a member of the Academy. The strongest influence on Watteau's art came



Courtesy Nat'l Gallery of Art, Kress Collection, Wash., D. C.

ITALIAN COMEDIANS. PAINTING BY ANTOINE WATTEAU

from P.P. Rubens (*q.v.*), the great Flemish master of the Baroque period. Although Watteau developed a definite and individual style of his own which made him, with his successor Fragonard, leading master of the French Rococo style (*q.v.*), his art is definitely rooted in Rubens' work and the affinity is most evident in both masters' sanguine drawings—Rubens' sketches more in the grandiose style of the Baroque, Watteau's drawings in the charm of the coming Rococo, but both with a similar approach. Watteau's work is represented in many galleries of Europe and the U.S. and is characterized by a singular delicacy combined with well-balanced composition. His principal subjects were scenes from court society, which he never tired of depicting in ever-changing aspects. Among his chief works are "Embarkation for Cythera," "Dance in the Open Air," "The Lute Player." His drawings are full of life and show excellent craftsmanship.

Watterson (*wŏt'tĕr-sŭn*), HENRY, journalist, born in Washington, D.C., Feb. 16, 1840; died Dec. 22, 1921. His father, Harvey McGee Watterson (1811-91), was a journalist. He was educated by private tutors and at an early age became editor of the Washington *Democratic Review*. In 1861 he moved to Nashville, Tenn., and edited the *Republican Banner,* but soon enlisted for service in the Confederate Army. He was on staff duty from 1861-63 and did scout service in connection with the army of Gen. Johnston. At the close of the war he again edited the *Republican Banner* at Nashville, but later founded the *Courier-Journal* at Louisville, Ky., which he made one of the most influential newspapers of his time. He served in Congress from 1876-77, but declined re-election. In 1893 he delivered the dedicatory speech at the Columbian Exposition in Chicago. Watterson is the author of: "Oddities of Southern Life and Character," "Life of Lincoln," and "History of the Spanish-American War."

Watts (*wŏts*), GEORGE FREDERICK, painter, born in London, England, Feb. 23, 1817; died July 1, 1904. He studied in the Royal Acad., where he made his first exhibit of paintings, in 1837. He won prizes for his paintings, "Caractacus" and "Alfred Inciting the Saxons to Prevent the Landing of the Danes." He was made a member of the Royal Acad. in 1867. Among his best-known paintings are: "Daphne," "Orpheus and Eurydice," "Love and Death," "Fata Morgana," "Meeting of Jacob and Esau," and "Love Triumphant."

Watts, ISAAC, clergyman and hymn writer, born in Southampton, England, July 17, 1674; died Nov. 25, 1748. His mother taught him from the classics when he was only four, and at eight he was able to write devotional pieces. In 1690 he enrolled as a student in an academy in London, and subsequently became pastor of the Independent congregation of Mark Lane, London.

Much study at an early age had greatly impaired his health, and for this reason he devoted his attention largely to literature and hymn writing instead of preaching. He is best known as the author of numerous hymns and psalms, including "Joy to the world, the Lord has come" and "Our God, our help in ages past." A monument in his memory was built in Westminster Abbey, London, England.

Watts-Dunton (*wŏts'-dŭn't'n*), WALTER THEODORE, poet and novelist, born Oct. 12, 1832, at St. Ives, Huntingdon, England; died June 6, 1914, at the Pines, Putney, England. He was educated for the law and practiced for many years in London. There he met the poets of the pre-Raphaelite school, the group which exerted the strongest influence on his own later writing. In 1874 he became a literary critic, first for the *Examiner* and, from 1875 to 1898, for the *Athenaeum*. His first book, "The Coming of Love and Other Poems," appeared in 1897. The following year he published a novel, "Aylwin." In 1916 a book of reminiscences, "Old Familiar Faces," and a posthumously published novel, "Vesprie Towers," appeared. Watts-Dunton befriended the poet Swinburne early in his career and from 1879 until the latter's death in 1909 Swinburne lived in Watts-Dunton's home. He was also a close friend of Dante Gabriel Rossetti, who dedicated his "Ballads and Sonnets" to Watts-Dunton as his most intimate friend. Watts-Dunton's own prose and poetry are romantic in the pre-Raphaelite tradition.

Waugh (*wạ*), EVELYN ARTHUR ST. JOHN, author, born in London, England, October 1903. He was educated at Hertford Coll., Oxford Univ., and began to write almost immediately after his graduation. He was converted to Catholicism in 1930. His novels include "Decline and Fall" (1928), "Vile Bodies" (1930), "Black Mischief" (1932), "A Handful of Dust" (1934), "Scoop" (1938), "Put Out More Flags" (1942), "Work Suspended" (1943), "Brideshead Revisited" (1945), "The Loved One" (1948), "Scott-King's Modern Europe" (1949), "Helena" (1950), "Men at Arms" (1952), "Officers and Gentlemen" (1955), and "The Ordeal of Gilbert Pinfold" (1957). Many of Waugh's novels are satires on the English upper class and contemporary civilization. His work is biting, penetrating, and often cruel, but always clever and amusing. He is also the author of biographies—"Rossetti" (1928) and "Edmund Campion" (1935)—and of several travel books.

Waukegan (*wạ-ḳē'gạn*), a city in Illinois, seat of Lake County, 40 m. N. of Chicago. Situated on a bluff on the western shore of Lake Michigan, Waukegan has a good harbor, capable of accommodating large freighters, and a yacht basin for pleasure craft. It is served by the Chicago & North Western, the Elgin, Joliet, and Eastern, and the Chicago, North Shore & Milwaukee R.R.'s. The manufactures include pharmaceuticals and chemicals, canning machinery, canned goods, millwork, iron, steel and wire products, electrical appliances, automotive equipment, outboard motors, tanned goods, asbestos products, roofing, boilers, paints, envelopes and other paper products. Noteworthy is Dickinson Hall, a local auditorium where Abraham Lincoln made the only speech he never finished, on April 2, 1860; he was interrupted by a fire in the town. Great Lakes Naval Training Station and Ft. Sheridan are near the city. Waukegan was settled in 1835 and was incorporated as a city in 1858. Population, 1950, 38,946.

Waukesha (*wạ'ḳē-shạ*), county seat of Waukesha County, Wisconsin, on the Fox River, 15 m. w. of Milwaukee. It is served by the Soo Line, the Chicago & North Western, and the Chicago, Milwaukee, St. Paul & Pacific R.R.'s. The city lies in the center of a rich agricultural and dairying region. It has extensive limestone quarries, and manufactures motors and motor parts, foundry items, refrigerators, lumber, church furniture, and machinery. Waukesha became a popular health resort with the commercial development of the White Rock Mineral Springs and other medicinal springs in this area. Noteworthy buildings include Carroll Coll., the oldest college in Wisconsin, a historical museum, a children's museum, a state industrial school for boys, and a veterans hospital. Waukesha was settled in 1836 on land which the Potawatomi Indians had ceded to the Federal government in 1833. Called Prairieville until 1852, Waukesha was incorporated in 1898. Population, 1950, 21,233.

Wausau (*wạ'sạ*), county seat of Marathon County, Wisconsin, situated on the Wisconsin River, approximately 195 m. N.W. of Madison. It is served by the Chicago & North Western and the Milwaukee R.R.'s., and bus lines. The principal industries are wood products, roofing, shoes, electric motors, beverages, dairy products, sawmill and paper-mill machinery, batteries, fishing tackle, paper and paper products, tools and fur farming. Granite and quartzite are quarried in abundance, and there are rich deposits of feldspar and nepheline syenite. Wausau is an all-season resort, with Rib Mt., the highest point in the state, an outstanding ski-run. Incorporated as a village in 1858, Wausau became a city in 1872. Population, 1940, 27,268; in 1950, 30,414.

Wave (*wāv*), the name applied to an advancing ridge or swell on the surface of a fluid, either liquid or gaseous, due to any force which causes the particles to be set in motion. *Visible* waves are caused when the surface of water is set in motion by the friction of the wind. *Invisible* waves result when a fluid is agitated by some force and consist of minute vibrations. They manifest themselves by their results, as in heat, light, and sound. If a tightly stretched wire or string, such as a piano wire or a violin string, is moved out of its position of rest momentarily, it is caused to move to and fro like a pendulum. This is true when the sides of a bell are struck. In either case, sound waves are produced. The number of complete vibrations made by a vibrating body in one second is termed the *frequency of its vibration,* and the distance through which a wave moves in a given time is called the velocity. Sound waves travel in the air with the same velocity, whether they are the short waves which produce the shrill sounds, or the long waves which produce the deep tones. On the other hand, light is caused by a wave motion in the luminiferous ether, and heat is produced by the rapid to-and-fro motion of the molecules in a body.

Waves upon the surface of water result when the particles are raised by the wind, and the surface tends to be quieted, or assume a condition of rest, through the force of gravity. In deep water the liquid mass does not advance, and the movement up and down is a local vibration. Apparently the wave progresses, but this is true only of the form, and is similar to the apparent motion of the thread of a screw when it is turned. The distance between the crests of two succeeding waves is called a *wave length,* and the corresponding parts of two different waves are their *like phases.* Wave motion in some parts of the sea is very complicated. A *tidal wave* may be moving steadily toward the west, distant storms may cause waves to move upon it, and ripples from the breeze then locally blowing may diversify the surface. This causes what is known as the *interference of waves. Breakers* do not occur in deep water, but are due to friction on the bottom of the sea, the effect being to retard the base of the wave while the crest rolls forward until a break occurs. Tidal waves are not noticeable on the surface of the ocean, but in some places become extremely high, sometimes 20 to 40 ft., especially where the current flows into an estuary or a narrowing inlet. The waves of the ocean, due to heavy winds, frequently rise to heights of 40 ft. above the general level.

Wavell (*wä′vęl*), ARCHIBALD PERCIVAL, EARL, soldier, born in Sussex, England, May 5, 1883; died in London, May 24, 1950. Educated at the Royal Military Coll. at Sandhurst, England, and at the Army Staff Coll., he saw service in several campaigns including the South African War, struggles on the Indian frontier, and the two world wars. In World War II, he was made a general (1940) and appointed commander in chief of British Middle East forces (1939-41), commander in chief of India (1941), and of Allied forces in the Southwest Pacific (1942). In 1943, he became field marshal and viceroy of India and was at the same time raised to the peerage. In February 1947 Louis Mountbatten (*q.v.*) replaced him as viceroy of India. He published several books on military subjects.

British Information Services Photo

FIELD MARSHAL WAVELL

Waverley Novels (*wā′vẽr-lȳ nŏv′ęls*), a series of novels by Sir Walter Scott (*q.v.*), written during the years 1814-25, and including "Waverley," "The Heart of Midlothian," "The Bride of Lammermoor," "Ivanhoe," "Kenilworth," and "The Talisman." The publication of these novels marked the height of Scott's career.

Waves (*wāvz*), World War II term for women in the U.S. Navy. See *Women in the Navy.*

Wax (*wăks*), a solid fatty substance allied to the fixed oils and fats, derived both from animal and vegetable sources. It differs from the fats in having greater hardness and a higher melting point. True wax contains no glycerin, does not dissolve in water, and gives off a bright flame in burning. The specific gravity is .96 and the melting point is 155° F. When its temperature is raised to 86° F., it may be molded into any form by the hand. The term wax was formerly restricted to beeswax, but it is now extended to various bodies possessing similar characteristics, found widely diffused in various parts of plants, as on the leaves of some species, in the pollen of some flowers, and in many kinds of fruits. *Beeswax* is the principal insect wax. It is the product made by the honey bee in building its honey cells. It is constructed of the sweet juices of plants and in a natural state has a light yellow color, but when separated from the honey and bleached it becomes white. Beeswax was formerly an important product for making candles, but its use for that purpose has been largely replaced by stearine. However, it is still used to some extent for that purpose, for models in casting, for statues in museums, and for wax fruit and flowers.

The chief vegetable waxes include *myrtle,* or *bayberry, wax,* which is made from a thin coating on the berries of the bayberry tree, and the *palm wax,* obtained extensively in Colombia and Brazil as an exudation on the surface of the growing leaves of the carnauba palm. Palm wax is in powder form when taken from the leaves and must be melted down into wax. The two principal grades of palm wax are "yellow," which is produced from leaves not completely unfolded and not exposed to the sun, and "fatty," a darker grade, which comes from leaves that have unfolded and been exposed to the rays of the sun. Other grades are made from processing either of the two principal types. (See also *Wax Palm.*) *Chinese wax* is a secretion deposited by an insect closely related to the lac, and is found as a white coating on the branches of several species of trees. It is a highly important article of trade in China and Japan, where it is utilized for medicinal purposes and candle making. *Cuba wax,* which is imported from Cuba, resembles Chinese wax. It is somewhat softer than beeswax and may be dissolved in warm ether and oil of turpentine. *Japanese wax* is obtained from the small stone fruits of several species of rhus cultivated in Japan. *Mineral wax* is a natural product and is employed in the manufacture of candles. It is found oozing in small quantities from rocks of coal formation, chiefly in California, Rumania, Austria, and Scotland. *Sealing wax* is a commercial product of importance, but is not properly a wax. Wax is employed to a considerable extent in making figures in imitation of sculptures, especially those of human beings.

Waxahachie (*wăk-sȧ-hăch'ē*), county seat of Ellis County, Texas, 30 m. s. of Dallas, on the Missouri, Kansas & Texas and other railroads. It has cotton gins, flour mills, and grain elevators and trades in farm produce. Waxahachie was incorporated in 1871. Population, 1950, 11,204.

Wax Palm (*wăks päm*), a species of trees native to Colombia and Brazil, which secretes a resinous substance, composed of one part of wax and two parts of yellow resin. These trees grow at elevations ranging more than 3,000 ft. above the sea and attain a height of 150 to 175 ft. The resinous secretion covers the trunk, and is found more or less abundantly on the leaves. It is obtained by felling the tree. A large tree yields 20 to 30 lbs., obtained by scraping. See *Palm Wax.*

Wax Plant (*wăks plănt*), a class of plants of the milkweed family, so called from the waxlike appearance of the flowers and leaves. Most of the species are climbing plants, throwing out aerial rootlets. The leaves are opposite and fleshy and the flowers are sweet scented, growing in dense umbels. Several species are highly prized as house plants. The honeyworts and begonias belong to this class of plants. They take root readily and are easily cultivated in windows.

Waxwing (*wăks'wĭng*), a class of birds native to North America and Europe, so named because the secondary wing feathers and the tail feathers are tipped with horny appendages resembling red or yellow sealing wax. The plumage is mainly brown and the head is decorated with an erectile crest. Most species are remarkable for their irregularity in migrating. Though all are birds of passage, they seldom revisit the same summer quarters or winter retreats. Two species are native to North America. Some writers class them with the flycatchers and others with the chatterers. The *cedar bird* is a familiar North American species, but it is somewhat smaller than the waxwing proper. The *Bohemian waxwing* is the most widely diffused of the European species, visiting Northern Europe in the spring and migrating to Northern Africa and Southern Europe in autumn. It has a weak, whistling song and is easily tamed. Its food consists of berries and insects.

Waycross (*wā'krôs*), county seat of Ware County, Georgia, 60 m. w. of Brunswick, on the Atlantic Coast Line. It is the gateway to the Okefenokee Swamp Park. The surrounding country produces livestock, lumber, pecans, and tobacco. Manufactures include tobacco products and naval stores. Waycross was incorporated in 1874. Population, 1950, 18,899.

Wayland (*wā'lạnd*), FRANCIS, educator and author, born in New York City, Mar. 11, 1796; died in Providence, R.I., Sept. 30, 1865. He studied medicine and theology at Union Coll. and in 1816 was admitted to the Baptist ministry. The following year he became a tutor at Union Coll., where he remained until 1821, when he was called as pastor to the First Baptist Church, Boston. He was made president of Brown Univ., in 1827, and filled that position for 28 years. Wayland was noted for his ability as a lecturer, orator, and writer of numerous works. His writings include "Elements of Moral Science," "Limitations of Human Reason," "Duties of an American Citizen," "The Collegiate System in the U.S.," "Salvation by Christ," and "Sermons to the Churches."

Wayne (*wān*), ANTHONY, general, born in East Town, Pa., Jan. 1, 1745; died in Erie, Pa., Dec. 15, 1796. He studied in Philadelphia and afterward became a surveyor. From 1774-75 he was a member of the Pennsylvania convention, was made a member of the committee of safety in the latter year, and at the beginning of the Revolutionary War was commissioned colonel of a Pennsylvania regiment. He was slightly wounded while commanding in the Battle of Three Rivers, Canada, but soon after took charge of his command at Ticonderoga. In 1777 he was made

Courtesy of the Metropolitan Museum of Art, N. Y.

ANTHONY WAYNE

Mezzotint by Edward Savage (1761-1817)

brigadier general and joined Washington's army at Morristown, N.J. Defeated by a British force under Howe at Paoli, Pa., Wayne later successfully raided the British supplies for the American troops at Valley Forge. His most daring exploit was the capture (July 16, 1779) of Stony Point on the Hudson River in a night attack with 1,200 men. Later, he supported Lafayette in Virginia, took part in the Yorktown campaign, and was present when Cornwallis surrendered. In 1783 Wayne occupied Charlestown (now Charleston), S.C., after Nathanael Greene had forced the British to evacuate the city; soon afterward, he retired from the Army. In 1784 Wayne was elected to the Pennsylvania legislature, and, in 1791, was sent to Congress as a representative from Georgia; he was unseated, however, because of irregularities in his election. Recalled to duty with the rank of major general in 1792 and put in command of the Army, he went to the Northwest Territory and decisively defeated the Indians at Fallen Timbers in 1794. In 1795 he made a peace treaty with the Indians at Ft. Greenville (see *Greenville,* Ohio). Early in 1796 Wayne again retired from the Army. The impulsiveness of his nature and his proneness to quarrel combined to earn him the nickname of "Mad Anthony Wayne," but he was recognized as a competent commander. A number of cities in the U.S. have been named in his honor.

Waynflete (*wān'flēt*), WILLIAM, English prelate, born *ca.* 1395; died May 11, 1486. Educated at Oxford Univ., he was ordained priest (1426), was master of Winchester Coll. before 1429, and became provost of Eton Coll. (1443). In 1447 he succeeded to the bishopric of Winchester and soon after received letters patent to found a hall at Oxford for the study of philosophy and theology. This hall was merged (1458) with Magdalen Coll. As lord chancellor of England (1456-60), Waynflete supported Henry VI (*q.v.*) in his struggles with the Yorkists and presided at the parliament at Coventry (1459) which attainted the Yorkists.

Wealth (*wĕlth*), a collective term employed in common speech to designate riches, such as a large possession of money, goods, or lands. It is used in economics to describe such objects as have utility and can be exchanged. The three criteria by which an object's value is determined are utility, difficulty of attainment, and transferability. All objects having these three essential characteristics are classed as wealth. Although many others may have value, they are not regarded as wealth in an economic sense. Thus air, health, and time, though highly essential, are not wealth in an economic sense, while wheat, houses, and land are classed as wealth. Some writers speak of skill, intelligence, and all mental and physical traits that facilitate the production of wealth as *nonmaterial wealth,* while all the objects answering to the threefold test stated above are classed collectively as *material wealth.* See also *Capital.*

Wealth of Nations, THE, title of a work on political economy by Adam Smith (*q.v.*), published in 1776. See also *Political Economy.*

Weapon (*wĕp'ŭn*), any instrument of offense or defense; anything used, or designed to be used, for destroying, defeating, or injuring an enemy, or for protecting one's self from such destruction, defeat, or injury. A list of offensive weapons would include the club, the sword, the bow and arrow, the spear, all types of firearms, and the atomic and hydrogen bombs. Among defensive weapons may be listed helmets, shields, and protective armor. See also *Ammunition; Bomb; Cannon; Chemical Warfare; Gunnery; Machine Gun; Military and Naval Progress; Missile; Rifle; Rocket; Torpedo.*

Weasel (*wē'z'l*), a small, slender, long-bodied, predatory mammal, *ca.* 8 in. long, with short legs, a small head, low, rounded ears, and a short tail; the male is much larger than the female. The pelage (coat) is composed of soft, close underfur overlaid with long guard hairs. In summer, the weasel is brown on the upper parts in sharp contrast to the white of under parts; the winter pelage, in northern latitudes, is white all over except for a black tip to the tail, which is present in most species.

When irritated or alarmed, the weasel is capable of ejecting a disagreeable smelling fluid from its anal glands. It feeds on small rodents, rabbits, moles, and some birds, is primarily terrestrial, and pursues its prey on the ground and in subterranean passages. It can swim and on occasion will climb the trunk of a tree.

The weasel is widely distributed in Europe, Asia, North Africa, and North and South America. There are several species, the common weasel or ermine (*Mustela erminea*), known as the stoat in Europe, is circumpolar in distribution, ranges south through Eurasia to North Africa, and, in the U.S., to Pennsylvania and California. The least weasel (*Mustela rixosa*), smallest of the weasels, has a very short tail without the black tip and is circumpolar in distribution. The short-tailed weasel (*Mustela nivalis*) is similar to, but larger than, the least weasel and occurs in Europe, parts of Asia and North Africa. The long-tailed weasel (*Mustela frenata*), common in the U.S., ranges from southern Canada to southern Peru and northern Bolivia and has a black-tipped tail 44 per cent or more of the length of its head and body.

Weather Bureau (*wĕTH′ẽr bū′rō*), an organization maintained by the Federal government for making meteorological observations, predicting weather and storms, and reporting atmospheric phenomena. Such bureaus are maintained by the leading governments of the world. They have compiled much useful information on rainfall, frost, floods, storms, and other weather phenomena and provide forecasting and warning service for industry, commerce, and transportation, including shipping and aviation.

A government weather service was established by the U.S. in 1870, under the Signal Corps. In 1891 its duties were transferred to the Dept. of Agriculture, and in 1940 the Weather Bureau was transferred to the Dept. of Commerce, where it now operates in coordination with the Civil Aeronautics Admin.

The U.S. Weather Bureau maintains about 300 offices at cities and airports throughout the country, as well as *ca.* 12,600 substations whose reports supplement those of the major offices. In addition, reports are made at *ca.* 600 other locations by other U.S. agencies. These stations are supplemented by pilot balloon and radiosonde stations, which provide reports on conditions in the upper atmosphere. The surface and upper-air observations, assembled over a teletype network of some 56,000 m., are charted and analyzed four times daily at 14 forecast centers distributed throughout the U.S. In 1956 the National Hurricane Research Project was begun, providing enormously increased knowledge of hurricane behavior and making possible early and accurate warnings. With the advent of electronics, the bureau established a network of high-power weather-surveillance radars from Texas to New England, each equipped to detect any hurricane whose eye was within 200 m. of the coast. Electronic computers also were installed, making possible the preparation of rapid and accurate weather maps. In 1960 the bureau entered a new era in meteorology when the National Aeronautics and Space Admin. launched Tiros I, the first experimental weather satellite. Subsequent Tiros satellites provided photographic records of meteorological phenomena that promised to revolutionize weather forecasting, and plans were in progress for more advanced weather satellites in series called Nimbus and Aeros.

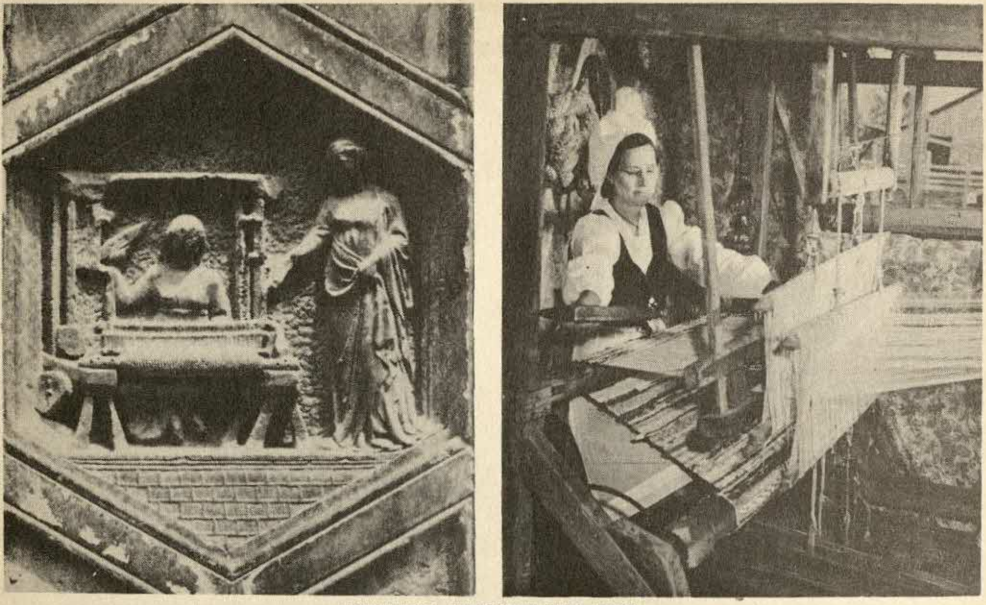
See also *Meteorology*.

Weaver (*wēv′ẽr*), JAMES BAIRD, lawyer and politician, born in Dayton, Ohio, June 12, 1833; died in Des Moines, Iowa, Feb. 6, 1912. After graduation from the Cincinnati Law School in 1856, he returned to Iowa. He served with distinction in the Union army, attaining the rank of brigadier general. He became a district attorney in 1866 and afterward edited the *Iowa Tribune* at Des Moines. In 1878 he was elected to Congress as a Greenback candidate and in 1880 was the party's nominee for President. He was re-elected to Congress in 1884 and again in 1886. He helped organize the People's party (*q.v.*), later the Populist party, and in 1892 was its candidate for President, receiving more than 1,000,000 popular votes and 22 electoral votes. He was a champion of labor and of bimetallism.

Weaver, ROBERT CLIFTON, economist, government official, born in Washington, D.C., Dec. 29, 1907. Educated at Harvard Univ., he was Negro adviser to the U.S. Dept. of the Interior (1933-37), special assistant to the U.S. Housing Authority (1937-40), and administrative assistant to the War Production Board (1940-42). Thereafter he served in private and public advisory posts until 1960, when he was appointed administrator of the Housing and Home Finance Agency, highest Federal executive post held by a Negro up to that time.

Weaver Bird (*wēv′ẽr bĩrd*), the common name of a large family of rather small birds noted for the elaborately woven nests constructed by many of the species. Some 260 species are recognized. The family is found chiefly in southern Asia, through the East Indies to Australia, and in Africa, where it is particularly numerous and diversified. The English sparrow or house sparrow belongs to the family and carries the distribution to northern Europe. Most of the species are dull plumaged, but some of them exhibit bright colors.

Most of the weaver birds build their nests singly, although commonly in colonies and often over water, where some protection from marauders is secured. The nests are often in the shape of an inverted pouch, with the entrance from below, sometimes through a tubelike projection. The most striking nests are those of the social weaver birds of Africa, which join forces, sometimes to the number of 200 or more pairs, to build a huge, roofed structure in a tree; each



WEAVING THROUGH THE AGES

The structure and operation of a hand loom have not changed much throughout history. The 14th century loom shown at left occurs in a relief by Andrea Pisano (1273-1348) on the Campanile of the Cathedral of Florence, Italy. The modern loom (*right*) is operated by an Acadian woman, a descendant of the French who settled in Nova Scotia in the 17th century.

pair is provided with a separate nesting compartment in the structure, each with its individual entrance.

Weaver birds are not accomplished songsters, but some of them are kept as cage birds on account of their cheerful, active ways and the bright colors of certain species.

Weaving (*wēv′ĭng*), the art of interlacing threads of different kinds, such as silk, wool, or cotton, thus forming a woven fabric. The loom is the frame or machine employed in weaving, and in its simpler form has come down to us from the nations of antiquity. Though clothing was first made of the skins of animals and of the leaves of trees, it is evident that spinning and weaving were practiced in the Stone Age. Evidences of this have been found in the lake dwellings of Switzerland, where spindle whorls and fabrics of flax were found among the remains. Weaving is represented in the sculptures on Egyptian tombs at Thebes. Women and slaves were highly skilled in hand weaving in ancient Phoenicia and Greece.

Although the hand looms of ancient civilizations were crude, they turned out excellent fabrics, many of them equal to the best of modern products. The principal drawback of the hand loom was that too much time was consumed in turning out the product. For this reason the invention and improvement of the power loom became an important subject for study. Weaving was not highly developed in England until in 1732, when a number of weavers settled there from the continent. Charles Wyatt, of Birmingham, in 1738, patented a machine for spinning by means of rollers. In 1784 Cartwright invented the power loom; since then it has been successively improved and other machines have been invented by which weaving has become a rapid process under the application of steam and electric power.

In all kinds of weaving, whether plain or figured, two sets of threads are employed, which traverse each other at right angles in the web. The one set of threads is called the *woof*, or *weft*. They are made to pass alternately under and over the other system of threads called the *web*, *warp*, or *chain*. In weaving fabrics of any kind, the warp threads are fastened in the loom, the number used depending on the fineness and width of the cloth. The woof or cross threads are wound on bobbins or spools and are placed in a shuttle. The warp threads, being stretched in the loom, are acted on by a movement that lifts and lowers alternate threads, thus allowing the shuttle to pass from side to side between the two sets of threads. When the woof thread has been carried between the warp threads, the lower threads are raised and the upper threads are lowered, after which the shuttle is returned. In this manner the shuttle consecutively carries the woof thread to and fro until the entire piece of cloth is completed. The shuttle is moved by hand in the hand looms and the threads are alternated by the action of the foot, but in power looms all the movements are by machinery.

Plain weaving consists of alternating every other warp thread. Besides this common method, many other kinds of weaving may be mentioned, such as taking up one thread and leaving two or three, interlacing to form a double cloth, and pile weaving. The last-named process is employed in making velveteens, velvets, and Turkish carpets. It consists of leaving pile warps above the surface in the form of loops, which are afterward cut by an attached mechanism to form the pile. Many other forms of weaving are utilized, such as are used in producing figured goods, and in interweaving different kinds of threads and threads of various colors. Weaving is applied in a more or less modified form in making cotton and woolen textiles, ribbon, carpet, silk goods, tapestry, damask, and velvet.

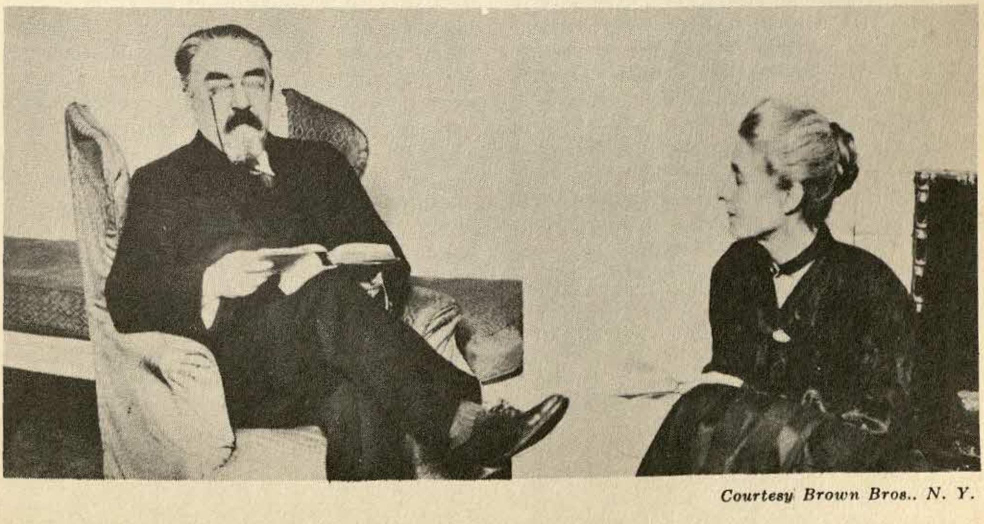
Webb (*wĕb*), ALEXANDER STEWART, soldier, born in New York City, Feb. 15, 1835; died Feb. 12, 1911. His father, James Watson Webb, sent him to the West Point Military Acad., from which he was graduated in 1855. In 1857 he was made professor of mathematics at West Point and at the beginning of the Civil War entered the Union army, taking part in the Battle of Bull Run. He commanded through the peninsular campaign in 1862, led a brigade at the battles of the Wilderness and Spottsylvania in 1864, and served on the staff of Gen. Meade from 1864 to the close of the war. In 1865 he was made major general of the U.S. Army, became professor at West Point shortly after, and in 1869 was elected president of the Coll. of the City of New York. He published "The Peninsula: McClellan's Campaign of 1862."

Webb, BEATRICE POTTER, Socialist, born in London on Jan. 22, 1858; died Apr. 30, 1943. She was the youngest of nine daughters of Richard Potter a rich railway president. She was educated privately, but got her real education from her father's friend, Herbert Spencer, and from a long trip to the U.S. which she made with her father when she was 15.

Although beautiful and wealthy, she refused to become a social belle. Her brilliant and eager mind had made her a freethinker by the time she was 20. As a result of surveying the poverty of the London slums she became a Socialist. In that way she met Sidney Webb (*q.v.*), whom she married in 1892. He was a small, bearded, soft-spoken man, and someone described him as a wren mated to an eagle, but he was the dominating force of her life and work. Together they labored to bring about a Socialist government in England, one which would benefit the common man, and one based on historical and statistical research. They wanted a government by experts and by facts. For the next 50 years they served on all the important committees for labor. She was a member of the royal commission on the Poor Law, and together they started the widespread movement in its favor. They were loaded with honorary degrees and drew to their side many famous people, such as G.B. Shaw and H.G. Wells.

Beatrice Webb collaborated on many of her husband's books, and was, herself, the author of "Co-operative Movement in Great Britain" (1891); "Men's and Women's Wages" (1919); and an autobiography, "My Apprenticeship" (1926).

Webb, JAMES WATSON, journalist and diplomat, born in Claverack, N.Y., Feb. 8, 1802; died in New York City, June 7, 1884. He was educated at Cooperstown, N.Y., and in 1819 was commissioned a second lieutenant in the U.S. Army. In 1826 he resigned from the army and



Courtesy Brown Bros., N. Y.

SIDNEY AND BEATRICE WEBB

became editor of the New York *Morning Courier,* which was consolidated with the New York *World* in 1861. Webb was appointed minister to Austria in 1849, but the senate refused to confirm the appointment. He served as minister to Brazil from 1861-70 and in the meantime negotiated a treaty for the removal of French troops from Mexico. He is the author of "Slavery and Its Tendencies," "Life and Adventures in the Rocky Mountains," and "National Currency."

Webb, SIDNEY, FIRST BARON PASSFIELD, economist and statesman, born in London, England, on July 13, 1859; died Oct. 13, 1947. He studied in Switzerland, Germany, and at the University of London. He began his long career of service by working as a clerk in various government departments. While still a government clerk he passed his bar examination.

In 1892 he was elected to the London County Council, the governing body of Greater London. In this same year he married Beatrice Potter and their lives from then on were a partnership devoted to the cause of socialism and the labor movement in England. They are one of the most famous husband-and-wife teams in history. Their story is the story of their work, because they sacrificed their private lives and dedicated themselves to working, writing, and speaking for the betterment of the poor and the working classes. They were among the founders of the Fabian Society (named for Fabius Cunctator who advocated tactics of caution and delay), and helped (1913) found the *New Statesman,* still the leading liberal weekly magazine in England for political and economic news and discussion. The London School of Economics and Political Science was established through their efforts.

Sidney Webb was a member of the executive council of the Labour party (1915-25) and also a member of Parliament. In 1919 he presented a complete plan for the nationalization of the coal mines. In the Ramsay MacDonald (Labour) cabinet of 1929 he was secretary for the colonies and dominions. He accepted the title of Baron Passfield, so that he might enter the House of Lords to advocate his theories of government. Among his published works are: "Industrial Democracy" (1897); "English Local Government" (15 vols., 1906-22); "Constitution for the Socialist Commonwealth of Great Britain" (1920); "Decay of Capitalist Civilization" (1923). See also *Webb, Beatrice Potter.*

Webb City (*web sity*), a city in Jasper County, Missouri, 7 m. N.W. of Joplin, on the Missouri Pacific and the St. Louis & San Francisco R.R.'s. It is an agricultural and industrial community. Lead mining is carried on in the surrounding areas. Webb City was founded in 1873. Population, 1950, 6,919.

Webb-Kenyon Act (*ken yun*), a Federal liquor traffic law, outlawing the shipment of liquor from "wet" to "dry" states, thereby aiding in the enforcement of prohibition in states outlawing the use of intoxicants. The U.S. Supreme Court declared its constitutionality on Jan. 8, 1917.

CARL MARIA VON WEBER

Weber (*vā'bĕr*), CARL MARIA FRIEDRICH ERNST, FREIHERR VON, composer, born near Lübeck, Germany, Dec. 18, 1786; died June 5, 1826, in London, England. He was descended from a family distantly—through marriage—related to that of Mozart. He showed early inclination to become a master musician. His father being a musical director, it became necessary that his instructors should be changed with each change of residence, but he studied principally under Michael Haydn at Salzburg and Vogler in Vienna. He composed an opera, called "Power of Love and Wine," at 13, and the following year completed his "Forest Maiden," which was soon put on the stage. In 1804 he became conductor of the opera at Breslau and two years later was engaged at Carlsruhe, in Silesia, by Prince Eugene of Würtemberg. He was musical director of the opera at Prague from 1813-16, and in the latter year founded the German opera at Dresden. His most famous opera, *"Der Freischütz"* ("The Archer"), was brought out at Berlin in 1822 and soon after was produced on the stage at Vienna, Paris, and London. In 1823 he completed his "Euryanthe," which was rendered amid much enthusiasm in Vienna, and soon after he accepted an invitation to visit London, where he produced his famous "Oberon." Weber is classed among the most eminent musical composers of the last century. He must be considered as the typical exponent of German Romanticism and, more than that, as the pioneer of the German opera, as distinct from the Italian and French opera. Therefore it is not astonishing that it was he who was of greatest influence later on Richard Wagner (*q.v.*). Although he composed 12 operas, among them (besides *"Der Frei-*

schütz"), "Preciosa," "Euryanthe," and "Oberon," it would be wrong to class him only as an operatic composer. His well-known orchestral composition, "Invitation to the Waltz," and many other orchestra and piano pieces prove his general importance as a composer. Weber's emphasis on melodious mood and the simplicity of his motifs make him popular as one of the most typically German composers.

Weber (*vā'bēr*), MAX, economist, sociologist, born at Erfurt, Germany, Apr. 21, 1864; died at Munich, in 1920. He held several important professorships at German universities, including Berlin (1893), Freiburg (1894), and Munich (1918). Before World War I, he opposed German expansion and championed democracy. His theories, presented in the form of lectures, treatises, and books, advocated a distinction between sociology and social philosophy, and contributed much to the fields of sociology, social philosophy, and economics. Among his publications are: "General Economic History" (English trans., 1927), "The Protestant Ethic and the Spirit of Capitalism" (English trans., 1930), and many others.

Weber (*wĕb'ēr*), MAX, painter, born in Bialystok, Russian Poland, April 18, 1881; died in Great Neck, N.Y., Oct. 4, 1961. A U.S. resident since 1891, he was graduated from Pratt Inst. in 1900. After teaching art in public schools, he studied in France, Italy, and Spain during 1905-06, concentrating on the great masters as well as the moderns. Returning to the U.S., he gave his first one-man show in 1911, attracting a great audience but also incurring bitter attacks; his work was called "brutal and vulgar" by some critics. Although his works were frequently exhibited, it was not until 1941 that he won full recognition. Since Weber actually introduced modern art to America, it is only natural that he became known as an exponent of modern painting; nevertheless, it is difficult to label his art. With energetic brush strokes and deep colors, he painted scenes, still lifes, and landscapes. His most impressive works, however, are based on Jewish material, such as "The Night Class," "Students of the Torah," and "Chassidic Dance." These paintings blend the deepest understanding of the human soul with gay irony, all powerfully expressed. For some years, Weber taught at the Art Students' League in New York City; in addition, he wrote and lectured on trends in modern art.

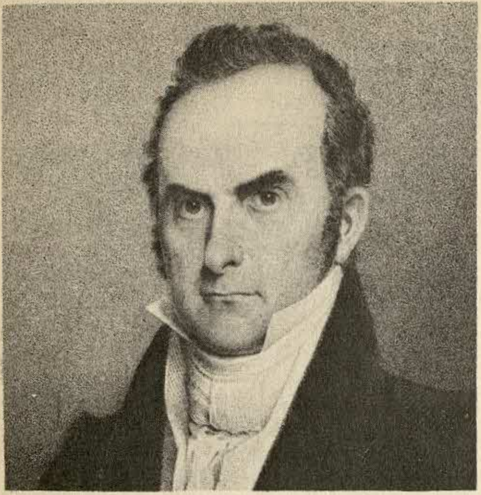
Webster (*wĕb'stēr*), a town in Worcester County, Massachusetts, on the French River, 15 m. s. of Worcester. It is served by the Boston & Albany and the New York, New Haven & Hartford R.R.'s. Surrounded by a fertile farming districts, the town enjoys several flourishing industries related to agricultural production. Among the manufactures are shoes, cotton and woolen goods, and machinery. A nearby natural feature is Lake Chaubunagungamaugg. The place was founded about 1713 as part of Dudley and Oxford. In 1832 it was set off from these towns, renamed for Daniel Webster, and incorporated as a town. Population, 1950, 12,160.

Webster, DANIEL, American orator and statesman, born Jan. 18, 1782, at Salisbury, N.H.; died Oct. 24, 1852, at Marshfield, Mass. Educated at Phillips Acad. and Dartmouth Coll., he entered the law office of Christopher Gore in Boston, being admitted to the bar in 1805. He began to practice in Portsmouth, and his striking qualities of mind, voice, and appearance soon led him from early triumphs in the courtroom out into the broader field of politics.

He first appeared in the House of Representatives in 1813, where he became known for his attacks upon the protective tariff, which he considered ruinous to the shipping interests of New England. Again elected to the House in 1823, he appeared in the Senate in 1827 and began his long career in this arena, where he was to taste the extremes of adulation and censure. As a Whig he was frequently in the minority during these critical years before the Civil War and the talents which he might have displayed in office were put to little use. He held office only briefly: as Secretary of State under Harrison and Harrison's successor, Tyler, and again as Secretary of State under Fillmore.

Though he never achieved the title of President, he earned another one of perhaps greater distinction—that of "defender of the Constitution and upholder of the Union." Webster's service to his country lay not in administration but in oratory. He was able to say in sonorous and ringing words the things people believed about America. His famous reply "Liberty and Union, now and forever, one and inseparable," to Hayne (*q.v.*), an advocate of states' rights, became the rallying cry of the North around the Union flag. His debates with Calhoun over the limitations of states' rights were the exalted speeches of a statesman who was defending the very foundations of his country's existence.

On Van Buren's election, Webster retired to private life and practice, and in 1839 visited England. When he returned to serve as Secretary of State, he settled the dispute with England over the northeastern boundary and finally left the cabinet for another period of retirement. His return to the Senate in 1845 was at a time of gathering disaster. He was accused of dishonesty while in the cabinet, and bore the trial of a Congressional investigation. He was found to be innocent, except for carelessness, but the slur remained. The Mexican War, which Webster opposed, brought in new slave territory and hastened the danger of an approaching civil war. Webster sup-



Courtesy Brown Bros., N. Y.

DANIEL WEBSTER

ported Clay's compromise measures in a desperate attempt to postpone war but was accused of wooing the South for Southern support of his Presidential hopes. It was Fillmore, however, who became the next President, and Webster again the Secretary of State. He held that office until just before his death.

Webster's private life was as stormy as his public one. His expansive way of living and the constant social life which he demanded got him into a financial morass. Although some of his soundest observations as a statesman were on banking and the financial policy of the government, Webster could not keep his own accounts. He was a person of magnetic personality and appearance in a way which is now somewhat outmoded. Without his true nobility of mind he might seem little more than an imposing front, a vain and superficial man who had succumbed to his own oratory, but he spoke for all Americans at a time when his voice was desperately needed.

Webster, JOHN, dramatist, born in England *ca.* 1580; died *ca.* 1624. The events of his life are almost entirely conjectural. Ambitious and unusually industrious, he began his career in 1602 by adapting John Marston's comedy, "The Malcontent" (1604), and collaborating with Thomas Decker on "Westward Hoe" and "Northward Hoe," (1604-05) and with others. His reputation rests primarily on "The White Devil" (1611) and "The Duchess of Malfi" (1614). Thereafter his reputation declined until the romantics revived him late in the 18th century.

More pessimistic than tragic, nearly devoid of humor, confined in subject matter to a morbid and almost melodramatic preoccupation with melancholy and death — Webster nevertheless achieved effects of great power, notably in his portrayals of women. Among Elizabethan dramatists he is often ranked second only to Shakespeare.

Photo by Trude Fleischmann, courtesy American Repertory Theater

MARGARET WEBSTER

Webster, MARGARET, actress and theatrical director, born in New York City, Mar. 15, 1905, the daughter of Dame May Whitty (*q.v.*) and Ben Webster. Educated in England, she made her acting debut in London in John Barrymore's production of "Hamlet" (1925), followed by appearances in several other plays by Shakespeare and by Shaw. Returning to New York, she entered the field of directing as well as acting, becoming noted particularly for her direction of the Maurice Evans (*q.v.*) productions of "Richard II," "Hamlet," and "Macbeth," and for her acting-directing role in "Othello" (1943-44), starring Paul Robeson. She produced, directed, and acted in "The Cherry Orchard" (1944), produced and directed "Androcles and the Lion" (1946), and acted in "The High Ground" (1951). A pioneer woman director at the Metropolitan Opera, she staged "Don Carlo" (1950), "Aida" (1951), and "Simon Boccanegra" (1960). Later she directed productions of the New York City Opera Company. She wrote "Shakespeare Without Tears" (1942) and "Royal Highness" (1949).

Webster, NOAH, American lexicographer, born Oct. 16, 1758, at Hartford, Conn.; died May 28, 1843, at New Haven, Conn. The traditional figure of the Yankee intellectual, he was the son of a Connecticut farmer, and a descendant of John Webster, early governor of Connecticut, and William Bradford of Plymouth. He was a village schoolteacher, a graduate of Yale, and was admitted to the bar at Hartford. In 1783 he published his "Grammatical Institute of the English Language." This combination speller and reader is one of the best-selling books ever to appear in America. Long after his death it was still a best seller, and for the 20 years following its appearance while Webster was working on his dictionary, the speller furnished most of his income. In 1788 Webster started the *American Magazine* in New York but it failed after a year. During Washington's Presidency he began to publish a daily paper, the *Minerva,* for the purpose of supporting the administration. But his newspaper and law activities were of minor importance; his real work was lexicography.

In 1806 he published "A Compendious Dictionary of the English Language," and a year later, "A Philosophical and Practical Grammar of the English Language." At about the same time he began work on his most important project, the dictionary for which he is most generally known and which today (published by the G. & C. Merriam Co.) is the well-known "Webster's New International Dictionary." While working on this dictionary, Webster spent some time in France and England. The "American Dictionary" as it was called, came out in two volumes in 1828. It contained 12,000 words. Today, the abridged form alone of Webster's Dictionary has almost 100,000 words. It was written with the same practical intent as the speller. It listed the words in common use and gave a simple spelling and definition for the use of the average reader. In this respect it differed in purpose from the other great one-man dictionary of the English language, Samuel Johnson's, which appeared in 1775. Johnson's was written to preserve the high standard of the language. Webster issued a second edition, revised and enlarged, in 1840.

Much of his life was spent in New Haven and in Amherst, Mass., where he was one of the founders of Amherst Coll. He was also a member of the Connecticut house of representatives. His other published works include "Dissertations on the English Language" (1789) and "Rights of Neutral Nations in Time of War" (1802).

Webster-Ashburton Treaty (*wĕb′stēr ăsh′-bûr-t′n trē′tĭ*). See *Ashburton, Lord Alexander.*

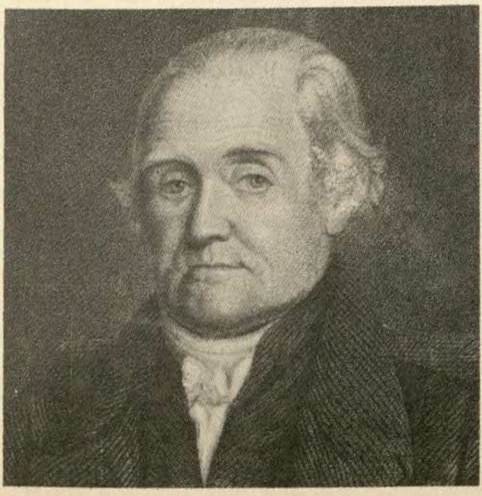
Webster City (*wĕb′stēr sĭt′ĭ*), a city in north central Iowa, seat of Hamilton County, on the Boone River, *ca.* 85 m. N.W. of Des Moines. It is served by the Illinois Central and other railroads. A food-processing center which manufactures farm equipment and washing machines, the city is the seat of a junior college. Settled in 1851, it was incorporated as a city in 1874. Population, 1960, 8,520.

Webster Groves (*wĕb′stēr grōvz*), a city in east central Missouri, 10 m. W. of downtown St. Louis. It is served by the Missouri Pacific R.R. and the St. Louis-San Francisco Ry. A residential suburb of St. Louis, the town is the seat of a junior-college campus of St. Louis Univ., Webster Coll., and Eden Theological Sem. Settled in 1803, Webster Groves was incorporated as a city in 1896. Population, 1960, 28,990.

Weddell Sea (*wĕ-dĕl′ sē*), a large body of water in Antarctica, lying west of the Coats Land inlet, but separated from it by glacial barriers. The sea was first called George IV Sea and then renamed for the English explorer, James Weddell, who discovered the region in 1823. See *Antarctica; Polar Exploration.*

Wedekind (*vā′dẹ-ḳĭnt*), FRANK, writer, born in Hanover, Germany, July 24, 1864; died in Munich, March 9, 1918. Wedekind began his literary career as a staff journalist on the magazine *Simplicissimus* in Munich. He is noted especially, however, for his plays. Concerned with social hypocrisy, particularly that involved with sexual matters, he was an effective and often bitter satirist, a forerunner of the expressionists of the post-World War I era. His plays include

NOAH WEBSTER



FRANK WEDEKIND

"The Awakening of Spring" (1891); "The Earth Spirit" (1895) and its sequel, "Pandora's Box" (1904), both used in the libretto of Alban Berg's opera "Lulu"; "The Marquis of Keith" (1900); and "The Love Potion" (1900).

Wedemeyer (*wĕd′ẹ-mī-ẽr*), ALBERT COADY, army officer, born in Omaha, Nebr., July 9, 1897. After his graduation from the U.S. Military Acad., he became a second lieutenant in 1918, rising to the rank of lieutenant general in 1945. In 1941, he was assigned to the Plans Group (later the Operations Division) of the General Staff, and in 1943, he became deputy chief of staff of the Southeast Asia Command under Lord Louis Mountbatten (*q.v.*). In 1944 he succeeded Gen. Stilwell (*q.v.*) as commander of the U.S. forces in China. After World War II, he served as chief U.S. military aid to Chiang Kai-shek (*q.v.*). During this time he prepared a detailed report on U.S. relations with China. His recommendations included U.S. intervention in Manchuria and a Big Five or U.N. guardianship over that area. The report (which was not acted upon) was published by the State Dept. in 1949. In 1946 he was named commanding general of the Second Army and in 1949 of the Sixth Army. In 1951 the Senate Armed Forces Committee released a secret report which he had prepared in 1947, accurately warning of a possible Russian-controlled North Korean invasion of South Korea. After retiring from the army (July 31, 1951), he became vice president of the Avco Manufacturing Co.

Wedge (*wĕj*), one of the simple mechanical devices, a modified form of the inclined plane. In the wedge the plane is moved under the weight, instead of moving the weight up the plane. It is used for splitting wood or stone, in lifting vessels in drydocks, and in pressing oils or juices from seeds. Two classes of the wedge are in use, the single wedge and the double wedge. The latter is the more common type. The force of a wedge is very great, since it is driven into position with a hammer or sledge. Axes, nails, pins, and knives are made on the principle of the wedge.

Wedgwood (*wĕj′wŏŏd*), JOSIAH, potter, born in Burslem, England, July 12, 1730; died there, Jan. 3, 1795. A descendant of a family of Staffordshire potters, he started working with his father at the age of nine. In 1759 he opened his own business at Ivy House Works in Burslem. Desiring to lift pottery from its utilitarian purpose, he introduced pottery enhanced by ornaments and later received a patent for a cream-colored porcelain, known as queen's ware. Success led to the opening (1769) of a large plant in Etruria, a colony he built for his artisans near Hanley. Wedgwood is best known for his light blue ware with Greek figures or ornaments in light relief as *décor,* the so-called Wedgwood ware, for his Egyptian ware (vases in black composite basalt), and jasper ware, a kind of translucent unglazed semi-porcelain. In tune with the neoclassical style of his time, Wedgwood reproduced the famous Portland Vase (*q.v.*). Many of the best artists (*e.g.,* John Flaxman) furnished designs for his wares, which are all marked by a revival of Greek forms and decoration. See also *Chinaware.*

WEDGWOOD MEDALLION

Wednesday (*wĕnz′dĭ*), the fourth day of the week, named from Woden or Odin, the chief Scandinavian deity. According to an old superstition, Wednesday was considered neither particularly lucky nor dangerous, but was a time of "middleness" or neutrality. It was for this reason that James Branch Cabell used the demigoddess Sereda, ruler of Wednesday, as the affector of all average things, in his novel "Jurgen."

Weed (*wēd*), THURLOW, journalist, born in Cairo, N.Y., Nov. 15, 1797; died in New York City, Nov. 22, 1882. Becoming a printer's apprentice at the age of 12, he grew interested in politics, served two terms in the New York legislature, and in 1830 founded the Albany *Evening Journal,* which he published for 35 years. In 1867, he became editor of the New York *Commercial Advertiser.* As a Republican editor, he wielded considerable influence in state and national affairs. He wrote several books, including an "Autobiography" (1884).

Weeds (*wēdz*), the general name applied to plants that are troublesome in cultivated grounds, owing to their persistence and rapid growth. Many weeds are obnoxious because they take up the fertility of the soil which should be utilized in supporting the cultivated plants. Others are injurious to stock or produce seed that decreases the value of cereals when mixed with them. The *cocklebur, ragweed, milkweed, Canada thistle,* and *Russian thistle* are obnoxious weeds that are difficult to destroy even by careful cultivation. Foxtail is a widely distributed weed, injurious only when allowed to grow so densely that it smothers cultivated plants. Burdock is a deeply rooted plant which is difficult to destroy. Wild mustard and dandelion are considered weeds, but the last-mentioned is cultivated for its flowers in some places. In fields where weeds are allowed to mature from year to year, they fill the ground with seeds, making it undesirable for cropping. Fields in this condition are greatly benefited by seeding with clover, timothy, or other useful grasses.

Week (*wēk*), the space of seven consecutive days, especially the cycle beginning with Sunday, the first day of the week, and ending with Saturday, the last day. The week has been in use in Eastern countries for reckoning time since prehistoric times, but was not introduced into the Roman calendar until after the reign of Theodosius, in the 4th century A.D. It is probable that the week was first instituted as a division of the periodical month, corresponding to the four quarters of the moon, or about seven and three-eighths days. The days of the week were named from the astrological notion that each of the seven heavenly bodies best known to the ancients had a modifying influence on the days according to the distance from the earth, and each body was regarded as presiding over an hour of the day. Hence, the Roman week was divided into seven days. These days were named in order from the sun, the moon, Mars, Mercury, Jupiter, Venus, and Saturn. The Jews and the early Christians applied no special names to the different days, but counted from the previous Sabbath; thus, Sunday was the first after the Sabbath, Monday the second, etc.

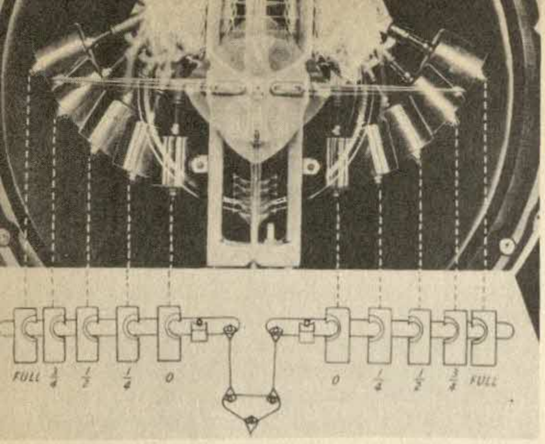
The Latin nations still retain the names derived from the Roman deities, but in the Germanic languages they have been replaced by names taken from those of the corresponding Germanic deities, except Sunday, Monday, and Saturday, these being still named after the sun, moon, and Saturn. Tuesday is named from Tyr, as the equivalent of Mars; Wednesday from Woden, for Mercury; Thursday from Thor, for Jupiter; and Friday from Freya, for Venus. The Society of Friends (*q.v.*) designates the days by their numbers, beginning with Sunday, as First-day, Second-day, etc. Both Jews and Arabs count the day as beginning and ending with sunset. For Jews and many Christian sects, Saturday is the Sabbath; the Mohammedans observe Friday.

Weeks (*wēks*), JOHN WINGATE, banker and politician, born at Lancaster, N.H., April 11, 1860; died there, July 12, 1926. After becoming a successful investment banker in Boston, he served as alderman, mayor of Newton, Mass. (1903-04), Congressman (1905-13), U.S. Senator (1913-19), and Secretary of War (1921-25) in the Harding and Coolidge administrations.

Weeks, SINCLAIR, cabinet member, born in West Newton, Mass., June 15, 1893. The son of John W. Weeks (*q.v.*), he was graduated from Harvard Univ. in 1914 and worked in a bank until 1916, when he went with a National Guard unit to the Mexican border. After serving two years in World War I, he returned to banking. In 1923, however, he went into a firm of silversmiths, becoming its vice president within five years, later president, and chairman of the board in 1945. Weeks early became interested in local politics and was mayor of Newton (1930-36). When Sen. Henry Cabot Lodge, Jr., resigned his seat to enter World War II, Weeks was appointed to complete the unexpired term (Feb. 8-Dec. 19, 1944). An able fund raiser, he became chairman of the national Republican finance committee and raised nearly $6,000,000 for the first Eisenhower campaign in 1952. He was Secretary of Commerce from 1953 to 1958.

Weever (*wē′vẽr*), a genus (*Trachinus*) of small, edible, spiny-rayed marine fishes, found off the coasts of Europe, in the sands of the sea bottom. The head is bare and bony, and the long body has two dorsal fins, supported by sharp, grooved spines. Glands at the base of the spines secrete a poisonous fluid; this fluid makes any wound caused by the spines quite painful. The greater weever (*Trachinus draco*), about 1 ft. long, and the lesser weever, about 6 in. long, are found off England; in both, the smaller, forward dorsal fin is black.

Weevil (*wē′v'l*), an extensive genus of beetles, distinguished by having the head elongated into a long snout, or rostrum, bearing the mouth parts at the end and the antennae at the sides. The various species are widely diffused and in the larval form are often highly destructive to roots, leaves, and fruits. Some species lay their eggs on the leaves of trees and afterward cut the leafstalk partly through, thus causing it to fall to the ground. The young insect feeds upon the leaves until sufficiently developed to bury itself in the ground, where it remains in the chrysalis state until spring. Other species, such as the *plum weevil,* or *curculio,* attack pears, plums, cherries, grapes, peaches, and apples. They lay their eggs in an opening made in the young fruit by a small sting. When the grub or larva is hatched, it eats its way into the stone or center of the fruit, thus causing it to fall from the tree. In this way access is obtained to the ground, which



Courtesy Toledo Scale Co., Ohio

RELATIONSHIP BETWEEN AUTOMATIC AND BEAM TYPE SCALES

is entered by the larva, and the developed insect soon appears.

The best-known species of these insects include the *corn weevil, boll weevil, bean weevil, grain weevil, nut weevil, rice weevil, grape weevil, palm weevil, clover weevil,* and *pine weevil.* All these species are more or less destructive to fruits, grains, and nuts. The *pine weevil* infests the pine forests of temperate and warm climates, often stripping those trees of their leaves. The *pear weevil* in a similar manner infests the pear tree. Turnips are also subject to ravages by weevils. Though the species attacking those vegetables are quite small, they feed on both the leaves and the roots. It has been found that the best security against many species of weevils is obtained by protecting the birds that feed upon their larvae, but certain species attacking fruit may be destroyed by careful application of chemicals. See also *Insects.*

Weigelia (*wī-gē′lĭ-ȧ*), an ornamental plant of the honeysuckle family, which is widely cultivated for its profuse flowers. Several species are native to China and Japan, whence they were brought to North America, but a number of species are indigenous to America. They are bushy shrubs, growing to a height of 5 to 6 ft. The leaves are oval and taper to a point. In most species the flowers are funnel-shaped and usually are white or pink in color. The *Rocky Mt. Weigelia* is a bush about 4 ft. high and the *southern bush honeysuckle* has sessile leaves, the stalk growing about 4 ft. high. These plants are less showy than those native to China.

Weighing Machine (*wā′ĭng mȧ-shēn′*), a mechanism used to ascertain the weight of bodies. Since weight is the result of the attraction of gravitation upon a body, an object or body does not have the same weight on all parts of the earth's surface, owing to the fact that the force of gravity decreases as the square of the distance from the center of the earth increases. Weight is least at the Equator, since the earth bulges and centrifugal force is strongest at that place, and it is greatest at the Poles, because the earth is flattened and centrifugal force is not a factor at those regions. A mass of iron which weighs 1,000 lbs. at the Equator would weigh 1,005 lbs. at either of the Poles. The same mass would weigh 500 lbs. at a point 2,000 m. below the surface of the earth and at an elevation of 1,650 m. above it, and the weight on the surface of the sun would be 28,000 lbs.

The term weight in ordinary use does not imply the absolute heaviness of a body, but rather its heaviness as compared to a piece of metal which is taken as a standard. When balanced against such a standard, the indicated weight of a mass will be the same everywhere, because the force of gravitation acting upon the standard will always be proportionate to that acting upon the mass. When weighed against the distortion of springs, the indicated weights will vary with variations in the pull of gravitation. In many modern scales the counterpoises are in the form of pendulums so arranged that moments of the counterpoises change automatically with changes in load. Some such automatic scales are ingeniously designed to print weights, count pieces, compute money values, or control packaging machines or other auxiliary devices.

The *platform scale* is the most common weighing machine to ascertain the weight of large quantities. It makes use of a number of levers, all of which are connected with the last lever of the series, or principal lever, and this is connected by a long arm with the short arm of the weighing beam. Several weights of different denominations are fitted to be suspended from the weighing beam, which is also furnished by a sliding weight to balance the scales. Thaddeus Fairbanks of Vermont patented such a weighing machine, in 1831, and since then numerous modifications and improvements have been made. Weighing machines based on the principle of *even balance* are used to a considerable extent. These consist essentially of a beam balanced upon a pivot, and the object to be weighed is placed on one end while a weight is placed on the other extremity of the beam. Usually each end of the beam has a pan for receiving the weights or the objects to be weighed, and in some forms a side beam is utilized, as in many scales used by grocers. The *steelyard* and the *torsion balance* are other forms of instruments for weighing.

Weights and Measures (*wāts′ and mā′zhûrz*), the science and system employed to determine unknown quantities in terms of known, relative units in which the quantity is to be expressed. To secure uniformity of measurement, most governments have established exact definitions of recognized units, frequently in the form of precise, physical representations. These representations are known as "standards," and are carefully preserved by governmental agencies as the basis of scientific and legal calculation. The standards now in use have been chosen arbitrarily, though in many cases natural phenomena have been followed in determining the value of the units. This may be seen from the fact that the average length of the foot, 12 in., was made the basis of the foot among the Greeks. On the other hand, the cubit of the Jews and the Egyptians was established upon the average length of the forearm. A law in England, passed in 1266, made 32 grains of wheat taken from the middle of the ear the basis of the English penny, while 20 pence were declared to be an ounce, 12 ounces a pound, and 8 pounds a gallon of wine. A London bushel contained 8 gallons of wine.

Apothecaries' weight is used only in the compounding of prescriptions, where it has been largely replaced by the more efficient metric system. For general purposes of commerce, the *avoirdupois* system remains in popular use; *troy* weight is the standard measure for gold, silver and similar precious metals. The *short ton* of 2,000 pounds is used commonly in the U.S., while the *British* or *long ton* is employed to some extent in the U.S. and almost exclusively in Great Britain. The latter contains 2,240 pounds, corresponding to twenty hundredweights (cwt.) of 112 pounds, each further divided into four quarters of 28 pounds. The common standard of weight by which the relative value of the three older systems are compared is the grain, which for this purpose may be regarded as the standard of weight. The pound troy and that of apothecaries' weight have each 5,760 grains, while the pound avoirdupois has 7,000 grains. The metric system, based upon simple decimal arithmetic, is becoming increasingly popular in international and scientific calculation.

TABLES OF COMMON WEIGHTS AND MEASURES

LONG OR LINEAR MEASURE

12 inches (in.) = 1 foot (ft.).
3 feet = 1 yard (yd.).
5½ yds. or 16½ ft. = 1 rod (rd.) or pole (p.).
40 rods = 1 furlong (fur.).
8 furlongs = 1 mile (mi. or m.).
320 rods or 5,280 ft. = 1 mile.
3 miles = 1 league.

SQUARE MEASURE

144 square inches (sq. in). = 1 square foot (sq. ft.).
9 square feet = 1 square yard (sq. yd.).
30¼ sq. yds. or 272¼ sq. ft. = 1 square rod (sq. rd.).
160 square rods = 1 acre (A.).
640 acres = 1 square mile (sq. mi.).

CUBIC MEASURE

1728 cubic inches (cu. in.) = 1 cubic foot (cu. ft.).
27 cubic feet = 1 cubic yard (cu. yd.).
24¾ cubic feet = 1 perch (P.).

WOOD MEASURE

16 cubic feet = 1 cord foot.
8 cord feet or 128 cubic feet = 1 cord (cd.).

Wood is usually corded in stacks 8 ft. long, 4 ft. wide, and 4 ft. high.

LIQUID MEASURE

4 gills (gi.) = 1 pint (pt.).
2 pints = 1 quart (qt.).
4 quarts = 1 gallon (gal.).

A standard barrel (bbl.) is 31 gallons, a hogshead (hhd.) 63, but both are made in various sizes.

APOTHECARIES' FLUID MEASURE

60 minims (m.) = 1 fluid dram (fl. d.).
8 fluid drams = 1 fluid ounce (fl. oz.).
16 fluid ounces = 1 pint (O.).
2 pints = 1 quart (qt.).
8 pints = 1 gallon (C.).

DRY MEASURE

2 pints (pt.) = 1 quart (qt.).
8 quarts = 1 peck (pk.).
4 pecks = 1 bushel (bu.).

The British bushel contains 2218.2 cu. in.; the U.S. bushel equals 2150.42 cu. in.

TROY MEASURE

24 grains (gr.) = 1 pennyweight (pwt. or dwt.).
20 pennyweights = 1 ounce (oz.) troy.
12 ounces troy = 1 pound (lb.) troy.
5760 gr. = 1 lb. troy.

APOTHECARIES' WEIGHT

20 grains (gr.) = 1 scruple (scr.).
3 scruples = 1 dram (dr.).
8 drams ap. = 1 ounce (oz.).
12 ounces ap. = 1 pound (lb.).

The pound, ounce, and grain have the same weight as those of troy weight.

AVOIRDUPOIS WEIGHT

$27\frac{11}{32}$ grains = 1 dram (dr.).
16 drams = 1 ounce (oz.).
16 ounces = 1 pound (lb.).
25 pounds = 1 quarter.
4 quarters or 100 pounds (U.S.) = 1 hundredweight (cwt.).
112 pounds (Gt. Brit.) = 1 long or gross cwt.
20 long hundredweight or 2000 pounds (U.S.) "net" or "short" = 1 ton (T.).
2240 pounds (Gt. Brit.) = 1 long ton.

7000 gr. = 1 lb. avdp. or 0.4536 kilogram. The "long ton" is widely used in commerce in the U.S.

TIME MEASURE

60 seconds (sec.) = 1 minute (min.).
60 minutes = 1 hour (hr.).
24 hours = 1 day (da.).
7 days = 1 week (wk.).
365 days 12 months = 1 common year (yr.).
366 days = 1 leap year.
100 years = 1 century.

One month is commonly reckoned as 30 days.

MARINERS' MEASURE

6 feet = 1 fathom
5280 feet = 1 statute mile
6076.103 feet* = 1 nautical mile

* This international measurement was adopted for use by the U.S. in 1954.

MEASURE OF ANGLES OR ARCS

60 seconds (″) = 1 minute (′).
60 minutes = 1 degree (°).
90 degrees = 1 right angle or quadrant.
360 degrees = 1 circle.

THE METRIC SYSTEM

MEASURES OF LENGTH

myr'i-a-me"ter	10,000 m	6.214 miles
kil'o-me"ter	1,000 m	0.62137 mile (3280 feet, 10 inches)
hec'to-me"ter	100 m	328 feet, 1 inch
dec'a-me"ter	10 m	393.7 inches
me'ter	1 m	39.37 inches
dec'i-me"ter	$^{1}/_{10}$ m	3.937 inches
cen'ti-me"ter	$^{1}/_{100}$ m	0.3937 inch
mil'li-me"ter	$^{1}/_{1000}$ m	0.03937 inch

Factors for Conversion: One inch = 0.0254 meter; one foot = 0.3048 meter; one mile = 1609.3472 meters.

Abbreviations cm = centimeter, dm = decimeter, km = kilometer, m = meter, mm = millimeter.

MEASURES OF SURFACE

hec'tare	10,000 m^2	2.471 acres
are	100 m^2	119.596 square yards
cen'tare	1 m^2	1550 square inches

Factors for Conversion: One square inch = 0.06452 square meter; one square yard = 0.836 square meter; one acre = 4047 square meters.

Abbreviations: a = are, ha = hectare, m^2 = square meter.

MEASURES OF CAPACITY

Name	Liter	Cubic Measure	Dry Measure
kil'o-li"ter (stere)	1000	1 m^3	1.308 cu. yds.
hec'to-li"ter	100	$^{1}/_{10}$ m^3	2 bush., 3.35 peck
dec'a-li"ter	10	10 dm^3	9.08 qts.
li'ter	1	1 dm^3	0.908 qt.
dec'i-li"ter	$^{1}/_{10}$	$^{1}/_{100}$ dm^3	6.1022 cu. in.
cen'ti-li"ter	$^{1}/_{100}$	10 cm^3	0.6102 cu. in.
mil'li-li"ter	$^{1}/_{1000}$	1 cm^3	0.061 cu. in.

Name	Liter	Cubic Measure	Liquid Measure
kil'o-li"ter (stere)	1000	1 m^3	264.17 gals.
hec'to-li"ter	100	$^{1}/_{10}$ m^3	26.418 gals.
dec'a-li"ter	10	10 dm^3	2.642 gals.
li'ter	1	1 dm^3	1.057 qts. liquid
dec'i-li"ter	$^{1}/_{10}$	$^{1}/_{10}$ dm^3	0.845 gill.
cen'ti-li"ter	$^{1}/_{100}$	10 cm^3	0.333 fl. oz.
mil'li-li"ter	$^{1}/_{1000}$	1 cm^3	0.271 fl. dr.

Factors for Conversion: One cubic inch = 0.0164 liter; one bushel = (U. S.) 35.235 or (British) 36.35 liters; one quart (dry measure) = 1.1011 liters; one peck = (U. S.) 8.81 or (British) 9.09 liters; one cubic yard = 765 liters; one fluid dram = 0.00369 liter; one fluid ounce = 0.0296 liter; one gill = 0.1183 liter; one quart (liquid measure) = 0.9463 liter; one gallon standard (231 cubic inches) = 3.785 liters; one gallon imperial (277.42 cubic inches) = 4.546 liters.

Abbreviations: cl = centiliter, cm^3 = cubic centimeter, dal = decaliter, dl = deciliter, dm^3 = cubic decimeter, hl = hectoliter, l = liter, m^3 = cubic meter, ml = milliliter, mm^3 = cubic millimeter.

Weights

Name	Gram	Water at Maximum Density	Avoirdupois Weight
mil″lier′ (tonneau)	1,000,000	1 m^3	2204.6 lbs.
quin′tal	100,000	1 hl	220.46 lbs.
myr′i-a-gram	10,000	10 l	22.046 lbs.
kil′o-gram	1,000	1 l	2.204 lbs.
hec′to-gram	100	1 dl	3.527 ozs.
dec′a-gram	10	10 cm^3	0.353 oz.
gram	1	1 cm^3	15.432 grs.
dec′i-gram	$^1/_{10}$	$^1/_{10}$ cm^3	1.543 grs.
cen′ti-gram	$^1/_{100}$	10 mm^3	0.154 gr.
mil′li-gram	$^1/_{1000}$	·1 mm^3	0.015 gr.

Factors for Conversion: One grain = 0.0648 gram; one avoirdupois ounce = 28.3495 grams; one troy ounce = 31.103 grams; one pound = 453.59 grams.

Abbreviations: cg = centigram, dg = decigram, g = gram, kg = kilogram, mg = milligram, q = quintal, t = tonneau (millier).

TABLES OF INTERRELATION OF UNITS OF MEASUREMENT

Tables of Interrelation of Units of Measurement[1]

1. *Units of Length*

Units	Inches	Links	Feet	Yards	Rods
1 inch =	1	0.126 263	0.083 333 3	0.027 777 8	0.005 050 51
1 link =	7.92	1	0.66	0.22	0.04
1 foot =	12	1.515 152	1	0.333 333	0.060 606 1
1 yard =	36	4.545 45	3	1	0.181 818
1 rod =	198	25	16.5	5.5	1
1 chain =	792	100	66	22	4
1 mile =	63 360	8000	5280	1760	320
1 centimeter =	0.3937	0.049 709 60	0.032 808 33	0.010 936 111	0.001 988 384
1 meter =	39.37	4.970 960	3.280 833	1.093 611 1	0.198 838 4

Units	Chains	Miles	Centimeters	Meters
1 inch =	0.001 262 63	0.000 015 782 8	2.540 005	0.025 400 05
1 link =	0.01	0.000 125	20.166 84	0.201 168 4
1 foot =	0.015 151 5	0.000 189 393 9	30.480 06	0.304 800 6
1 yard =	0.045 454 5	0.000 568 182	91.440 18	0.914 401 8
1 rod =	0.25	0.903.125	502.9210	5.029 210
1 chain =	1	0.0125	2011.684	20.116 84
1 mile =	80	1	160 934.72	1609.3472
1 centimeter =	0.000 497 096 0	0.000 006 213 699	1	0.01
1 meter =	0.049 709 60	0.000 621 369 9	100	1

2. *Units of Area*

Units	Square Inches	Square links	Square feet	Square yards	Square rods	Square chains
1 square inch =	1	0.015 942 3	0.006 944 44	0.000 771 605	0.000 025 507 6	0.000 001 594 23
1 square link =	62.7264	1	0.4356	0.0484	0.0016	0.0001
1 square link =	144	2.295 684	1	0.111 111 1	0.003 673 09	0.000 229 568
1 square yard =	1296	20.6612	9	1	0.033 057 85	0.002 066 12
1 square foot =	39 204	625	272.25	30.25	1	0.0625
1 square chain =	627 264	10 000	4356	484	16	1
1 acre =	6 272 640	100 000	43 560	4840	160	10
1 square mile =	4 014 489 600	64 000 000	27.878 400	3 097 600	102 400	6400
1 square centimeter =	0.154 999 7	0.002 471 04	0.001 076 387	0.000 119,598 5	0.000 003 953 67	0.000 000 247 104
1 square meter =	1549.9969	24.7104	10.763 87	1.195 985	0.039 536 7	0.002 471 04
1 hectare =	15 499 969	247 104	107.638.7	11 959.85	395.367	24.7104

Units	Acres	Square miles	Square centimeters	Square meters	Hectares
1 square inch =	0.000 000 159 423	0.000 000 000 249 1	6.451 626	0.000 645 162 6	0.000 000 064 516
1 square foot =	0.000 01	0.000 000 015 625	404.6873	0.040 468 73	0.000 004 046 87
1 square rod =	0.000 022 956 8	0.000 000 035 870 1	929.0341	0.092 903 41	0.000 009 290 34
1 square yard =	0.000 206 612	0.000 000 322 831	8361.307	0.836 130 7	0.000 083 613 1
1 square rod =	0.006 25	0.000 009 765 625	252 929.5	25.292 95	0.002 529 295
1 square chain =	0.1	0.000 156 25	4 046 873	404.6873	0.040 468 7
1 acre =	1	0.001 562 5	40 468 726	4046.873	0.404 687
1 square mile =	640	1	25 899 984 703	2 589 998	258.9998
1 square centimeter =	0.000 000 024 710 4	0.000 000 000 038 610 06	1	0.0001	0.000 000 01
1 square meter =	0.000 247 104	0.000 000 386 100 6	10 000	1	0.0001
1 hectare =	2 471 04	0.003 861 006	100 000 000	10 000	1

3. *Units of Volume*

Units	Cubic inches	Cubic feet	Cubic yards	Cubic centimeters	Cubic decimeters	Cubic meters
1 cubic inch =	1	0.000 578 704	0.000 021 433 47	16.387 162	0.016 387 16	0.000 016 387 16
1 cubic foot =	1728	1	0.037 037 0	20 317.016	28.317 016	0.028 317 016
1 cubic yard =	46,656	27	1	764 550.4	764.5594	0.764 559 4
1 cubic centimeter =	0.061 023 38	0.000 035 314 45	0.000 001 307 94	1	0.001	0.000 001
1 cubic decimeter =	61.023 38	0.035 314 45	0.001 307 943	1 000	1	0.001
1 cubic meter =	61 023.38	35.314 45	1.307 942 8	1 000 000	1000	1

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[1] Adapted from information issued by U.S. Bureau of Standards.

Continued on next page

4. *Units of Capacity Dry Measure*

Units	Dry pints	Dry quarts	Pecks	Bushels	Liters	Dekaliters	Cubic inches
1 dry pint =	1	0.5	0.0625	0.015 625	0.550 599	0.055 060	33.600 312 5
1 dry quart =	2	1	0.125	0.031 25	1.101 198	0.110 120	67.200 625
1 peck =	16	8	1	0.25	8.800 58	0.880 958	537.603
1 bushel =	64	32	4	1	35.2383	3.523 83	2150.42
1 liter =	1.816 20	0.908 102	0.113 513	0.028 378	1	0.1	61.0250
1 dekaliter =	18.1620	9.081 02	1.135 13	0.283 78	10	1	610.250
1 cubic inch =	0.029 761 6	0.014 880 8	0.001 860 10	0.000 465 025	0.016 386 7	0.001 638 67	1

5. *Units of Mass Greater Than Avoirdupois Ounces*

Units	Avoirdupois ounces	Avoirdupois pounds	Short hundred-weights	Short tons	Long tons	Kilograms	Metric tons
1 avoirdupois ounce =	1	0.0625	0.000 625	0.000 031 25	0.000 027 901 79	0.028 349 53	0.000 028 349 53
1 avoirdupois pound =	16	1	0.01	0.0005	0.000 446 428 6	0.453 592 427 7	0.000 453 592 43
1 short hundredweight =	1600	100	1	0.05	0.044 642 86	45.359 243	0.045 359 243
1 short ton =	32 000	2000	20	1	0.892 857 1	907.184 86	0.007 184 86
1 long ton =	35 840	2240	22.4	1.12	1	1016.047 04	1.016 047 04
1 kilogram =	35.273 957	2.204 622 34	0.022 046 222	0.001 102 311 2	0.000 984 206 4	1	0.001
1 metric tor =	35 273.957	2204.622 34	22.046 223	1.102 311 2	0.984 206 40	1000	1

6. *Units of Capacity Liquid Measure*

Units	Minims	Fluid drams	Fluid ounces	Gills	Liquid pints
1 minim =	1	0.016 666 7	0.002 083 33	0.000 520 833	0.000 130 208
1 fluid dram =	60	1	0.125	0.031 25	0.007 812 5
1 fluid ounce =	480	8	1	0.25	0.0625
1 gill =	1920	32	4	1	0.25
1 liquid pint =	7680	128	16	4	1
1 liquid quart =	15 360	256	32	8	2
1 gallon =	61 440	1024	128	32	8
1 milliliter =	16.2311	0.270 518	0.033 814 7	0.008 453 68	0.002 113 42
1 liter =	16 231.1	270.518	33.8147	8.453 68	2.113 42
1 cubic inch =	265.974	4.432 90	0.554 113	0.138 528	0.034 632 0

Units	Liquid quarts	Gallons	Milliliters	Liters	Cubic inches
1 minim =	0.000 065 104	0.000 016 276	0.061 610 2	0.000 061 610 2	0.003 759 77
1 fluid dram =	0.003 906 25	0.000 976 562	3.696 61	0.003 696 61	0.225 586
1 fluid ounce =	0.031 25	0.007 812 5	29.5729	0.029 572 9	1.804 69
1 gill =	0.125	0.031 25	118.292	0.118 292	7.218 75
1 liquid pint =	0.5	0.125	473.167	0.473 167	28.875
1 liquid quart =	1	0.25	946.333	0.946 333	57.75
1 gallon =	4	1	3785.332	3.785 332	231
1 milliliter =	0.001 056 71	0.000 264 178	1	0.001	0.061 025 0
1 liter =	1.056 71	0.264 178	1000	1	61.0250
1 cubic inch =	0.017 316 0	0.004 329 00	16.3867	0.016 386 7	1

Weihaiwei (*wā'hī'wā'*), a port and naval station on the northeast coast of Shantung, China, in the Yellow Sea. It was captured by the Japanese in 1895 and occupied by them until 1898 when China leased the port to Great Britain. On Oct. 1, 1930, Great Britain formally restored Weihaiwei to China. The port was overrun early in the Japanese invasion of China (1931). Population, *ca.* 7,000.

Weill (*vīl*), KURT, composer, born in Dessau, Germany, March 2, 1900; died in New York City, April 4, 1950. Educated at the university and at the State Acad. of Music in Berlin, he lived there until 1933, then went to Paris and, a year later, to the U.S. His first musical show, the medium in which he achieved his greatest success, was "Marie Galante" (1934). Productions for which he wrote the music include "Johnny Johnson" (with Paul Green, 1936), "The Eternal Road" (with Max Reinhardt, 1937), "Knickerbocker Holiday" (with Maxwell Anderson, 1938), "Lady in the Dark" (with Moss Hart and Ira Gershwin, 1941), "One Touch of Venus" (with S.J. Perelman and Ogden Nash, 1943), "The Firebrand of Florence" (with E.J. Mayer and Ira Gershwin, 1945), "Street Scene" (with Elmer Rice and Langston Hughes, 1947), and "Lost in the Stars" (with Maxwell Anderson, 1949). The best known of Weill's operas, written while he was still in Germany, is "Three-Penny Opera" (1928), a modern version of "The Beggar's Opera." He also wrote music for ballets, a cantata, and a symphonic fantasy.

Weill, who was one of the originators of modern European music for the theater, adapted himself easily to the American scene. By employing his individual tonal language in combination with the plain tunes of American folk music, he succeeded in creating new forms of operatic expression in the American theater.

Weil's Disease (*vīlz dĭ-zēz'*), in medicine,

KURT WEILL

an epidemic disease discovered by Adolf Weil (1848-1916). Caused by a certain kind of spirochaeta (*q.v.*), its symptoms are sometimes identical with those of bronchitis, pneumonia, or influenza, sometimes with those of meningitis, and, most often, with those of jaundice.

Weimar (*vī'mär*), a city in Germany, chief town of Thuringia, 50 m. s.w. of Leipzig. It is situated on the Ilm River and is connected by railroads with the trade centers of Germany. The city has many parks and numerous noteworthy buildings, including the grand ducal palace, the Gothic town hall, the court theater, a public library, and many fine schools and churches. Weimar is world-renowned as the home of Goethe, Schiller, Herder, Wieland, Lucas Cranach, and many great men of the arts.

Weimar's manufactures include pottery, clothing, scientific instruments, and chemicals, but its trade is chiefly local. The inhabitants are predominantly Protestant. It was here that the German National Assembly met in 1919 after the fall of the German Empire to adopt the constitution of the new German Republic. During World War II, Weimar was captured on Apr. 12, 1945, by the U.S. Third Army, and was later included in the Russian zone of occupation. Pop., *ca.* 50,000.

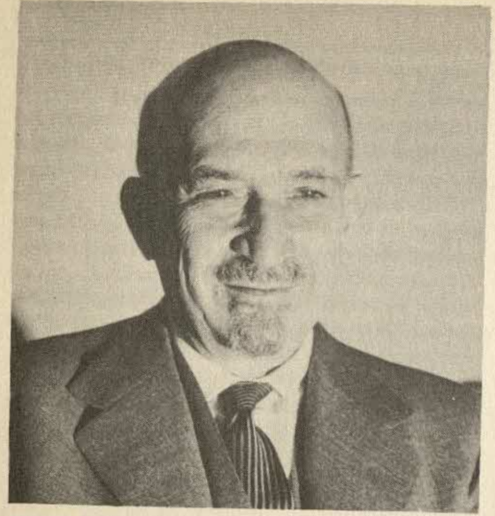
Weinberger (*wīn'bĕrg-ĕr*), JAROMIR, Czech composer, born in Prague, Bohemia, 1896. After elementary study there, he worked in Germany under Max Reger (*q.v.*), who influenced him strongly, especially as to contrapuntal composition. He was on the faculty of Ithaca (N.Y.) Conservatory (1922-26). He returned to Europe in 1926, coming back to the U.S. for good some years afterward. Weinberger's fame rests especially upon his folk opera "Schwanda the Bagpiper," and variations on "Under the Spreading Chestnut Tree," but his other orchestral works also show his musical gift and versatility.

Weir (*wēr*), HARRISON WILLIAM, artist and author, born in Lewes, England, May 5, 1824; died Jan. 4, 1906. His ability as a designer on wood was developed at an early age, and he produced some notable wood engravings in 1840. He is noted principally for skill in painting, an art in which he was self-taught. In 1849 he exhibited his "Dead Shot" at the British Institution. He soon became a member of the Society of Painters in Water Colors, and produced many landscapes and paintings of animals, flowers, and country life. His works include: "Christmas Carol," "A Servant of All Work," "The Forester," and "Startled." He illustrated many books and prepared wood engravings for periodicals. He wrote several books, including: "Animal Stories," "Bird Stories," and "Our Cats."

Weir, ROBERT WALTER, painter, born in New Rochelle, N.Y., June 18, 1803; died in New York City, May 1, 1889. He first received instruction in New York City, but in 1824 went to Italy, where he studied for several years. In 1829 he became a member of the National Acad. of Design, and three years later was elected professor of drawing in the West Point Military Acad. After holding that position for 42 years, he retired to his residence in New York City. Among his best works are: "Landing of Henry Hudson," "Embarkation of the Pilgrims," "Indian Captive," "Christ in the Garden," "Pier at Venice," "View of the Hudson from West Point," "Belle of the Carnival," "Virgil and Dante Crossing the Styx," and "Our Lord on the Mt. of Olives."

Weismann (*vīs'män*), AUGUST, biologist, born in Frankfort-on-the-Main, Germany, Jan. 27, 1834; died Nov. 6, 1914. His father was professor of languages in the gymnasium, where he studied until 1852, when he entered the Univ. of Göttingen. He studied natural sciences in Vienna and Paris, and in 1861 became physician to Archduke Stephen of Austria. He published his "Development of the Diptera" in 1864. Subsequently he studied zoology at the Univ. of Giessen and in 1866 became professor at Freiburg in Breisgau. Weismann is noted for his extensive research in cell structure of the body and made many valuable discoveries leading to his germinal theory, in which he concluded that acquired characteristics affecting the body cells and not the germ cells are not inherited. He was the author of a number of books on topics in his field.

Weizmann (*vīts'män*), CHAIM, first president of Israel, born in Motol, Russia, Nov. 27, 1874; died in Israel, Nov. 9, 1952. A research chemist, he taught at the Univ. of Geneva from 1901 to 1904 and later at the Univ. of Manchester. In 1916 he was made director of the British Admiralty Laboratories, with the special assignment of discovering a method of synthesizing acetone, an essential ingredient in the manufacture of the smokeless powder, cordite. He solved the problem in a very short time and the story is that Weizmann, who had long been an enthusiastic Zionist, replied, when asked what reward he wanted: "For myself, nothing; but something for my people." In any case it was not long before the issuing of the Balfour Declaration, by which the British government pledged the establishment of a Jewish national home in Palestine. His other activities in connection with Jewish affairs included the presidency of the World Zionist Organization (1920-31 and after 1935) and of the Jewish Agency for Palestine (after 1935). One of the founders of the Hebrew University in Jerusalem, he became chairman of its board of governors in 1935. Weizmann resigned as president of the World Zionist Organization in 1946, following his failure to agree on policy with major Zionist leaders. Weizmann, in the minority, was willing to accept British proposals for partition of Pales-



CHAIM WEIZMANN

tine between Arabs and Jews; while the majority of the Zionist leaders were willing to accept nothing less than the creation of a Jewish national homeland in Palestine. His election as the President of the Council of Government of Israel (*q.v.*) in 1948 made him, in effect, the new nation's provisional president, and in 1949, he was elected president. He published his autobiography, "Trial and Error," in 1949.

Welding (*wĕld′ĭng*), the joining of two pieces of like metals at suitable temperatures into a permanent bond. The processes are *hammer* or *blacksmith welding, oxy-acetylene, electric arc, carbon arc, resistance, spot-welding, atomic hydrogen* and *thermit welding*. The metals that are weldable and generally used are carbon steels, iron, low alloy steels, chrome iron and steels, cast steel, gray and malleable cast iron, copper and copper alloys, aluminum and aluminum alloys, nickel and high nickel alloys and clad steels. The weld is made on a butt or a lap joint after cleaning and proper alignment in flat, vertical and overhead positions when using the oxy-acetylene or the electric arc process.

Welding is used in all types of construction and manufacture, and is applied to almost countless numbers of repair operations. Welding is one of the most important operations in the production of heavy machinery, and is the chief step in the production of such heavy equipment as locomotives and ships. Practically all metal-working shops do some welding.

In the low carbon steel field when welding with the *electric arc* a coated electrode with a steel core is used in making contact with the part to be welded after proper ground connections have been made. The distance necessary from plate to tip of electrode is approximately ⅛ in. and this is called "arc length" or "proper arc." The efficiency of the weld depends upon the correct polarity and the proper rod. The coating on the welding rod, after contact is made with the part to be welded, throws off a gas that blankets the arc. The metal passes from the end of the rod in the molten state to the back of a crater made by the arc when a coating of slag, also from rod coating, forms instantly on the metal deposited, keeping the metal free from oxygen and nitrogen, improving the nature of the deposit.

In the steel alloy field the weld and the weld area must be heat-treated to prevent corrosion attacks on the heat-affected areas adjacent to the weld. When using the *oxy-acetylene* process on low carbon steel, a bare wire can be used to a

WELDING

Courtesy General Electric Co.

reasonable efficiency. On chrome and nickel steels in the ferrous field and nonferrous field on coppers and copper alloys, a flux is necessary when using the oxy-acetylene method. Welding of low carbon steel with electric arc and oxy-acetylene processes is a general practice.

Welding of alloy steels and copper or copper alloys for high pressures or high temperatures is practiced only when the proper metals are selected by highly skilled technicians with a grounding in physics, chemistry, and metallurgy.

In the airplane industry, the materials to be welded are usually of lighter gauge, such as aluminum, chrome, stainless steel, and low carbon steel. For these the oxy-acetylene process and resistance welding are used.

Resistance welding is a metal fabricating process in which the fusing or welding temperature is generated at the point of contact (joint) of the metals by resistance to the flow of an electric current. A heavy current is passed through the point where the weld is desired. The three most common types of resistance welding are butt, spot, and seam welding. Spot welding is a process in which the weld is made at one particular spot or point. In a butt weld, edges of material come in contact and are welded together. In seam welding, overlapping sheets of material are welded together.

Welfare Island (*wĕl'fâr ī'lạnd*), originally Blackwell's Island, a narrow island 1½ m. long in the East River between Manhattan Island and Long Island. A part of New York City, it derives its name from the fact that it is given over to about 20 hospitals. These include the City Hospital, comprising 18 buildings, a nurses' home, and special hospitals for the treatment of cancer and neurological diseases.

Welfare State (*stāt*), a term applied, sometimes disparagingly, to a state whose government attempts to provide, through taxation, free milk for school children, medical care, old-age pensions, and other social services. See also *Fair Deal.*

Well (*wĕl*), a deep hole of small diameter sunk into the earth for the purpose of obtaining various substances, such as water, natural gas, or petroleum. Wells for water are usually dug by hand with a spade, or by mechanical diggers, where water is desired at no great depth, usually from 10 to 60 ft. If water cannot be obtained at reasonable depths by digging, the wells are then made by boring or drilling. A well bored for water may be from 6 in. to 2 ft. in diameter, but generally not more than 150 ft. in depth, and the inside casing usually consists of ordinary well tile or metal pipe. On the other hand, drilled wells are frequently put down to great depths and usually range from 100 to 3,000 ft. They are cased in the inside with piping to prevent caving, and pumps used in such wells are protected by screens. In most instances wells of this kind are lined with a casing that serves for the pump itself.

The machinery used in sinking wells by boring and drilling consists chiefly of a derrick, usually from 30 to 70 ft. in height; a machine for boring or drilling, which consists of bits and drills to suit the size wanted; and a windlass for lowering and raising the drill. The machinery is operated by steam, gasoline, or diesel engines. In boring a well, the auger is turned by the engine or power acting upon the main rod, and, when the auger is filled with earth, it is raised by the windlass to be cleaned, after which it is again lowered for boring. Drilling is the only method by which wells can be sunk where the strata are hard and the depth is considerable. For this purpose a so-called *diamond drill* is used, with which it is possible to penetrate any rock, no matter how hard. Drills of this kind are generally used in prospecting for coal, iron ore, petroleum, and precious metals.

Rotary drilling is employed in the petroleum industry. In this method, a bit is attached at the bottom of the drill pipe which is suspended from hoisting machinery on the derrick. The drill pipe is rotated by means of a rotary table. The action of the rotary table plus weight on the bit bores into the subsurface of the well. The cuttings from the bit are removed by a drilling fluid, of mud or a mixture of clay, iron oxide, barium sulfate, sodium silicate, and other chemicals, which is pumped into the drill pipe from above and which washes the cuttings to the surface.

Welland (*wĕl'ạnd*), a river of Canada, in the province of Ontario. It rises in southern Ontario and, after an easterly course of 60 m., flows into the Niagara River a short distance above Niagara Falls. The Welland River is important for the reason that it is joined with the Welland Canal, thus forming a part of the system that passes around Niagara Falls and connects the navigation of Lake Ontario with that of Lake Erie. This canal is about 30 ft. deep, 80 ft. wide, and 28 m. long. It has a total lift of 6 ft., made by 328 locks. The town of WELLAND, capital of Welland County, is situated on the Welland Canal, near the Welland River, about 12 m. s. of St. Catharines. It is on the Canadian National, the Wabash, and the Michigan Central R.R.'s. It has manufactures of flour, machinery, and lumber products. Population, *ca.* 10,500.

Welles (*wĕlz*), GIDEON, statesman, born in Glastonbury, Conn., July 1, 1802; died in Hartford, Conn., Feb. 11, 1878. He studied law and in 1826 became editor of the Hartford *Times,* the chief organ of the Democratic party in Connecticut. With the foundation and organization of a national Republican party in 1856, Welles became one of its most ardent supporters. He served as Secretary of the Navy in the cabinets of Lincoln

United Press International Photo

ORSON WELLES
Starring in the film "Compulsion"

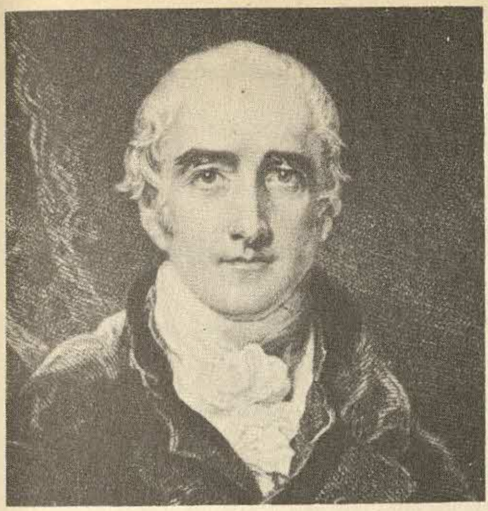
and Johnston (1861-69), and during a large part of the Civil War he maintained a coast blockade of about 2,000 m. He also organized a fleet of ironclads and transports on the Mississippi River, and in various ways contributed to the naval victories of the North. He published "Memoirs of the War" and "Lincoln and Seward."

Welles, (GEORGE) ORSON, actor, director, and author, born May 6, 1915, in Kenosha, Wis. He spent four years at the Todd School in Woodstock, Ill., and acted (1931-32) with the Gate Theater in Dublin, Ireland. He returned (1933) to the U.S. to tour with Katharine Cornell (*q.v.*) and in 1936 became connected with the Federal Theater Project, directing "Macbeth" and "Dr. Faustus." In 1937 he founded the Mercury Theater, and later, the Mercury Theater of the Air. His radio production (1938) of H. G. Wells's "War of the Worlds" was so realistic that thousands of people fled their homes, believing that the U.S. had actually been invaded by Martians. In 1939 Welles went to Hollywood, where he wrote, directed, produced, and acted in the films "Citizen Kane" (1940), "The Magnificent Ambersons" (1942), and "Macbeth" (1947). Later movie appearances included "Journey Into Fear" (1942) and "Jane Eyre" (which he also produced, 1943). He made a number of pictures in Europe, where he lived from 1949 to 1956, including "The Third Man" (1950), "Othello" (1955), and "Moby Dick" (1956). On his return to the U.S. in 1956, he appeared in "King Lear" at the New York City Center, playing the title role from a wheel chair because of a leg injury. In 1958 he appeared in the film adaptation of William Faulkner's "The Long, Hot Summer," and in 1959 in "Compulsion," based on Meyer Levin's book about the Loeb-Leopold case (in which Welles plays a fictionalized Clarence Darrow, *q.v.*). Welles also was coeditor of "Everybody's Shakespeare" (1933) and the "Mercury Shakespeare" (1939).

Welles, SUMNER, diplomat, born in New York, N.Y., Oct. 14, 1892; died in Bernardsville, N.J., Sept. 24, 1961. He was graduated (1914) from Harvard Univ. He immediately entered the diplomatic service and was stationed (1915-17) at the American embassy in Tokyo, Japan. Latin-American assignments followed, notably at the State Dept. and in the Dominican Republic (1922, 1929) and Honduras (1924). He was Assistant Secretary of State (1933-37)—except for a brief period (April to December, 1933) when he was ambassador to Cuba—and was Under Secretary of State (1937-43). In 1940 a confidential mission to discuss economic and political conditions carried him through the principal European capitals, and in January 1942 he was the U.S. delegate to the Pan-American Conference at Rio de Janeiro. In 1952 he became president of Freedom House. He was the author of several books, including "The Time for Decision" (1944), "We Need Not Fail" (1948), and "Seven Decisions that Shaped History" (1950).

Wellesley (*wĕlz'lȳ*), a town in Norfolk County, Massachusetts, 15 m. w. of Boston, on the Boston & Albany R.R. It is a residential and college town. Wellesley Coll. is located here. The town was founded *ca.* 1640 and was incorporated in 1881. Population, 1950, 20,549.

Wellesley, RICHARD COLLEY, MARQUESS OF, statesman, born in Dublin, Ireland, June 20, 1760; died in London Sept. 26, 1842. He was the eldest son of the first Earl of Mornington, an Irish peer, and the eldest brother of the Duke of Wellington (*q.v.*). After attending Eton Coll., he entered Oxford Univ., whence he was graduated in 1870, and on the death of his father, in 1781, became Earl of Mornington, taking his seat in the Irish House of Peers. He was elected to the British House of Commons, in 1784, and was soon after made lord of the treasury by Pitt. In 1797 he became a member of the House of Lords and the following year was made governor general of India, where the French and Tippoo Sahib, a powerful prince, had formed an alliance against the British. His first success was the capture of a number of French officers, whom he sent to Europe, and afterward he invaded Mysore, capturing Seringapatam and slaying Tippoo Sahib in battle. It was due to the services of Wellesley that England held predominating influence in India. Wellesley was sent to Spain as envoy in 1805, but Perceval made him secretary of state for foreign affairs before the end of the same year. In 1821 he became lord lieutenant of Ireland, in which position he tried unsuccessfully to reconcile the Protestants and Catholics, but by this policy he lost the support of the Orangemen. When his brother, Wellington, opposed the Catholic Emancipation, he resigned the lord lieutenancy. Earl Grey appointed him to the office a second



RICHARD C. WELLESLEY

time, in 1833, but the ministry fell soon after and Wellesley retired from official life. His "Memoirs and Correspondence" was edited by R.R. Pearce.

Wellesley College (*wĕlz'lĭ kŏl'ĕj*), an institution of higher learning for women, located at Wellesley, Mass. Founded in 1875 by Henry Fowle Durant to offer young women educational opportunities "equivalent to those usually provided in colleges for young men," it is now one of the foremost liberal arts colleges for women. Notable buildings of the college include the administration building, the infirmary, Alumnae Hall, a library containing more than 230,000 volumes, the music building, the memorial chapel, and the department of hygiene and physical education. The founder's estate of 400 acres has been converted into a beautiful campus. The college has an enrollment of about 1,500 undergraduates and about 50 graduate students, and the faculty is composed of approximately 200 members. Mildred McAfee Horton, World War II director of the WAVES, served as president of the college from 1936 until 1949, when she was succeeded by Margaret Clapp. In February 1946 Wellesley adopted a revised curriculum arrived at after prolonged study to determine the particular needs of women students in the U.S.

Wellington (*wĕl'ĭng-tŭn*), capital of Sumner Cty., Kansas, 30 m. s. of Wichita, on Slate Creek and on the Santa Fe and other railroads. It has railroad shops, flour mills, and grain elevators. The oil fields nearby were developed in the 1930's. Wellington was settled in 1871 and was incorporated in 1872. Population, 1940, 7,246; in 1950, 7,747.

Wellington, seaport city and the capital of New Zealand; a port, with a fine natural harbor, situated at the southern tip of North Island and facing South Island across the narrow waters of Cook's Straits. It was founded in the year 1840 by the emigrants of the New Zealand Co., led by Capt. Arthur Wakefield. In 1865, the capital was transferred from Auckland to Wellington. The city is connected by railroad with Auckland and the principal cities of North Island, and by ferry with South Island. It is the seat of Victory Univ. Coll., affiliated with the Univ. of New Zealand, and has several parks and a botanical garden. The industries include the manufacture of shoes and soap, tanning, foundry work, textiles, brewing, and meat packing. Population, *ca.* 115,000.

Wellington, ARTHUR WELLESLEY, FIRST DUKE OF, "the Iron Duke," and England's great soldier hero, was born in Ireland, it is believed at Dungan Castle, May 1, 1769; died at Walmer Castle, England, Sept. 14, 1852. He was educated at Eton and the military college in Angers. He was the fourth son of the Earl of Mornington. It was not until he was sent out to India in 1796 as colonel of a regiment that he saw active service in the field. He gave serious study to warfare and to the Indian political scene. On his recommendation his eldest brother, Richard Wellesley (*q.v.*), accepted the governor generalship of India. Wellington was advanced rapidly and his vigorous campaigns against the native tribes, together with his administration of conquered territory, taught him statesmanship as well as soldiering. In the Peninsular War of 1808-14 his military renown was established. He landed in Portugal to fight the French armies that had invaded the peninsula; his superior supply lines and organization helped to defeat Napoleon's armies. For his victory at Talavera he was given a peerage and after Salamanca he was made a marquess. When the French were finally driven back across the border and defeated at Orthes and Toulouse, the victorious Wellington, now commander of the Spanish armies as well, returned to England to be rewarded with more than $2,000,000 and created a duke.

He was made British ambassador at Paris and envoy to the Congress of Vienna. On hearing that Napoleon had escaped, he informed his government that the French would never flock to him again. But the Bourbon government fled and Napoleon again threatened Europe. Wellington and Blücher were ordered by the Allies to attack Napoleon from the north until the Russians and Austrians could arrive from the east. The brief campaign ended with the Battle of Waterloo (*q.v.*) in June 1815. Although it is forever associated with Wellington's name, he did not singlehandedly win the battle and was more than once close to disaster in the three-day struggle. But his steadfastness against attack and his determination not to lose contact with Blücher were perhaps as large a factor in winning the battle as were the defections of Napoleon's marshals in losing it.

Wellington's services after the surrender were

British Official Photo

DUKE OF WELLINGTON

also important. As head of the occupation forces in Paris he promptly restored a government and arranged financial credit for the French so that they could pay their indemnity and reduce the time of occupation from five years to three. When he returned to England he had set a shaky monarchy on its feet, but mainly he had prevented Austria from setting up an army of observation in the west of Europe. As the most influential man in Europe, he could not escape taking part in England's foreign policy. He was sent to St. Petersburg to persuade Emperor Nicholas I to keep his hands off of Turkey; this mission failed. His honors at home, however, continued. In 1828 he became prime minister. He carried through the Catholic Emancipation Act but refused to heed the demand for parliamentary reform. His stand brought down his party, and his successor, Lord Grey, introduced the Reform Bill. Popular wrath against him was such that a mob hooted him on the anniversary of Waterloo, and he had iron shutters put on his London house. Later, he supported the Corn Law reforms and his final years were peaceful and full of honors. He was, in summary, a Tory and an aristocrat, not seeking popular applause. His brilliant victories and firm discipline in war did not produce the personal fervor and adulation of his troops, as in the case of Napoleon, his great antagonist. He died a national hero and was given a hero's burial under the great dome of St. Paul's Cathedral in London. *Cf.* Tennyson's inspiring "Ode on the Death of the Duke of Wellington."

Wellman (*wĕl'măn*), WALTER, journalist and explorer, born at Mentor, O., Nov. 3, 1858; died Jan. 31, 1934. He studied in his native state, founded the Cincinnati *Evening Post* in 1869, and in 1884 became correspondent for the Chicago *Herald* and other newspapers. He went to the Bahama Islands in 1892 and located the landing place of Columbus on Watling Island. He was one of the first to advocate the theory that the North Pole can be reached best by means of aerial navigation, and in 1905 published a number of articles giving advanced views upon this subject. Later, in 1908 and 1909, he made unsuccessful attempts to reach the North Pole in an airship. He published many books, including "The German Republic."

Wells (*wĕlz*), DAVID AMES, economist, born in Springfield, Mass., June 17, 1828; died Nov. 5, 1898. He was an eminent advocate of free trade and author of many treatises on financial and economic subjects. In 1867 he was commissioned by the U.S. government to visit Europe with the view of inspecting and reporting on competitive industries. He was made an associate of the French Acad. in 1874, and was otherwise honored by numerous foreign societies and universities. His writings include "Science of Common Things," "Elements of Natural Philosophy," "Practical Economics," "Relation of the Tariff to Wages," "Our Merchant Marine," and "Principles of Taxation."

Wells, HERBERT GEORGE, novelist and journalist, born in Bromley, Kent, on Sept. 21, 1866; died in London, Aug. 13, 1946. His father had been a gardener who turned shopkeeper and finally became a professional cricketer. His mother had been in her youth a lady's maid, and then housekeeper in a large country house. The boy was a scholarship student in science at the Univ. of London, and a disciple of T.H. Huxley. At first he intended to be a biologist and he remained a brilliant student and exponent of science, but his own early poverty makes it easy to see why most of his life was spent in the cause of reform. Wells became a prolific writer, a rich and successful man, but he never forgot the horror of widespread poverty.

His early studies led directly to his scientific romances and prophecies. These novels of scientific speculation include "The Island of Dr. Moreau," wherein a surgeon operates on animals and turns them into human beings, who, however, never lose their animal traits; "The War of the Worlds," in which men from Mars invade the earth (the actor, Orson Welles [not related to him], dramatized this story so effectively on the radio shortly before World War II that it caused a panic among some of his listeners who really thought that men from another planet had reached the earth); "The War in the Air," wherein he foretold the effects of air power as borne out much later in World War II; and "A World Set Free," in which he prophesied (with painful and unblended accuracy) the use of atomic bombs.

All his novels are frameworks for his convic-

Courtesy British Information Services, N. Y.

H. G. WELLS

tions—economic or social reform, the emancipation of woman ("Ann Veronica"), the development of a ruling class ("A Modern Utopia"), betterment of education ("John and Peter"). None of them is a novel of first rank in the sense that it creates the inescapable presence of real, living character. However, Wells was a great journalist. His ridicule of class structures and hackneyed beliefs, his scorn for timidity, for the toleration of poverty in this modern world, and his visions of a world ruled by reason and science, all had a tremendous influence on his generation. His campaign against the worn-out world was unceasing. He was a member of the Fabian Society and, in 1922, an unsuccessful candidate of the Labour party for Parliament. His success lay in his writing.

Perhaps the best-known example of his original and pioneering mind is in "The Outline of History" (1920), wherein he attempts to reform the teaching of history. In this story of the development of the human race from its earliest records, Wells seeks a truer sense of proportion for the history of any one nation and for the narrow, nationalistic view of its people. He saw "One World" long before Wendell Willkie discovered it. And he lived long enough to see in World War II not only the startling fulfillment of some of his scientific prophecies, but the dire effects of that nationalistic mind which he sought to destroy. Another important work is "The Anatomy of Frustration," a penetrating study of the relation of the enlightened man in a world hemmed in by petty rules and cruelties.

Among his other many novels are "The Time Machine"; "Kipps," a study of the problems besetting a lower-class family moving into wealthier circles; "Tono-Bungay," a satire on advertising, and the English predecessor of "Babbitt"; "Bealby"; "History of Mr. Polly"; "The Research Magnificent"; "Mr. Britling Sees It Through," how an Englishman struggled to adjust himself to World War I; "Boon," "The World of William Clissold"; "The Shape of Things to Come."

Wellston (*wĕlz'tŭn*), a city of St. Louis County, Missouri, near St. Louis, on the Wabash R.R. It is a residential and manufacturing suburb of St. Louis. Wellston was settled in 1863, but was not incorporated until 1949. Population, 1950, 9,396.

Wellston, a city in Jackson County, Ohio, 75 m. s.e. of Columbus and 40 m. from the Ohio River on State Route 75. It is served by the Baltimore & Ohio and the Chesapeake & Ohio R.R.'s. The city is surrounded by a rich mineral region, having deposits of iron, coal, limestone, clay, shale, natural gas, gravel, sandstone, flint, and silt. Manufactures include garments, stock storage equipment, cranes, barges, and coal tipples. Lake Alma, with its fishing facilities, is a popular recreation center. The city was founded in 1874, on the site of a blast furnace built by Harvey Wells, and named for Wells. Though there were only a few settlers in 1871, Wellston grew rapidly and was incorporated as a city in 1876. Population, 1950, 5,691.

Wellsville (*wĕlz'vĭl*), a city in Columbiana County, Ohio, 38 m. n. of Wheeling, W.Va. It is situated on the Ohio River, 48 m. below Pittsburgh, and is on the Pennsylvania R.R. Coal and fire clay are obtained in the vicinity. It has manufactures of brick, pottery, hardware, leather belting, and machinery. Wellsville was incorporated in 1833. Population, 1950, 7,854.

Welwitschia (*wĕl·wĭch'ĭ·ȧ*), a plant found in the desert regions of South Africa. It was so named from Friedrich Welwitsch (1806-72), a German botanist. The plant is represented by a single species, which somewhat resembles a giant radish. The stem is not more than 2 or 3 ft. high, but develops so as to be as much as 12 ft. in circumference. Two long and leathery leaves spring from the main root, and these frequently become torn and dry, but no other leaves appear. However, short flower stalks spring from the base of these leaves from year to year. Botanists estimate that some of these plants subsist for more than a century.

Wen (*wĕn*), in medicine, a harmless sebaceous cyst, generally on the scalp. It is usually removed by operation.

Wenceslas (*wĕn'sĕs·lăs*), VACLAV, or VACSLAV, king and patron saint of Bohemia, born *ca.* 903; died at Alt-Bunzlau, Sept. 28, 935. His father was Duke Wratislaw, a Christian who favored Germany; his mother, Drahomira, was the daughter of a pagan prince. Wenceslas received religious instruction from his grandmother, St. Ludmilla, and was educated at Budweis, perhaps for the clergy. When Wratislau died in 926, Drahomira became regent and encouraged a political reaction against Germany and the Christian church. She supported the pagan Wends in their wars with Germany. When hostilities broke out between Germany and Bohemia, Wenceslas assumed rule over the duchy and made peace with the Holy Roman Emperor, Henry I. Bohemia was placed under the protection of Germany, and Wenceslas received the title of king. He re-established the Christian church in Bohemia and sought to improve the religious and cultural ideals of his people. His policies aroused the enmity of the Bohemian nobles, however, and Wenceslas' brother Boleslau murdered him outside the church of Alt-Bunzlau. His body, which had been hacked to pieces, was brought to the Cathedral of St. Vitus in Prague in 938. Wenceslas, known as "Good King Wenceslas," is renowned for his virtues and recognized as the martyr saint of Bohemia.

Wenceslaus (*wĕn'sĕs-lạs*), Holy Roman Emperor (1378-1400) and King of Bohemia (1378-1419), born in Nuremberg, Feb. 26, 1361; died in Prague, Aug. 16, 1419. He was the son of the Emperor Charles IV and Anna, daughter of Henry II, Duke of Schweidnitz. Wenceslaus was crowned King of Bohemia in June 1363, and invested with the margravate of Brandenburg in 1373. He married Joanna, daughter of Albert I, Duke of Bavaria, in 1370. Elected King of the Romans, or German King, at Frankfort-on-the-Main on June 10, 1376, he was crowned the following July 6 at Aix-la-Chapelle. On the death of the emperor, in 1378, Wenceslaus became sole ruler of Germany and Bohemia, giving Brandenburg over to his half-brother, Sigismund. He inherited Luxemburg from his uncle Wenceslaus in 1383 and four years later helped Sigismund gain possession of the throne of Hungary.

Wenceslaus' imperial reign was a difficult and unsuccessful one, since he was incapable of checking the constant warfare between cities and nobles. He tried to establish a league for peace (1384) and bring about a victory for the cities (1387), but the Peace of Eger (1389) proved a triumph for the nobles. His obvious preference for Bohemia, his sale of Milan to Gian Galeazzo Visconti, and his attempt, with the aid of Charles VI of France, to end the papal schism by the election of a new Pope so enraged the imperial electors that he was deposed and forced to abdicate the German throne in 1400.

Wenchow (*wŭn'jō*), a port in the province of Chekiang, China, about 20 m. from the mouth of the Wu River. Its exports include tea, silk, timber and paper products. Population, *ca.* 650,000.

Wener (*vā'nẽr*), or VENER, the largest lake in Sweden, which is next in size to lakes Onega and Ladoga in Russia, and thus the third largest lake of Europe. It is situated 150 m. s.w. of Stockholm. The elevation above the sea is 150 ft. and its greatest depth 310 ft. The lake is 90 m. long, is from 10 to 50 m. wide, and has an area of 2,010 sq. m. It receives the overflow from several smaller lakes and its outlet into the Kattegat is by the Göta River. The lake has fine fisheries and in its vicinity are valuable forests. A canal connects it with Lake Wetter. It has canal connections with the Baltic Sea and the Kattegat.

Werewolf (*wēr'wŏŏlf*), a mythical creature, supposed to be a person who has been transformed or is capable of transforming himself into a wolf, with a wolf's man-eating appetite. Belief in the existence of the man-wolf, first mentioned in ancient Greek mythology, was a popular superstition from early in the Middle Ages down to the 17th century in England, Wales, Ireland, and a large part of the European continent. According to the legend, a person who voluntarily changed himself into a wolf could restore himself to human shape at will, but one who became a werewolf through the evil enchantment of another could not resume his normal form until the spell was broken. The fabulous creature appears frequently in folklore. In Germany toward the end of World War II, and after the war, a secret "werewolf" (in German, *werwolf*) organization was said to have been formed by Nazi party members pledged never to submit to the Allied forces. Scattered incidents of sabotage and assassination in occupied Germany were attributed to the "werewolf" gang, but it was not proved for certain that the organization was responsible, or even that it existed on any scale worthy of consideration.

Werfel (*vĕr'fẹl*), FRANZ, author, playwright, poet, born in Prague, Czechoslovakia, Sept. 10, 1890; died Aug. 26, 1945. Educated in Prague, Hamburg, and Leipzig, he later taught at the Univ. of Leipzig. He served in the Austrian army during World War I, on the Russian front. An established literary figure in Vienna, in November of 1940 he escaped from the Nazis and later found a home in the U.S. Of his many volumes of poetry, the first was "Der Weltfreund" (1911) and the last, an American publication, was "Poems" (1946). One of his earliest dramatic works was a trilogy in verse, "Spiegelmensch" (1920). Performances in the U.S. include: "The Goat Song" (1926), "The Eternal Road" (1937), and an adaptation by S. N. Behrman, "Jacobowsky and the Colonel" (1944). Although best-known as a novelist, he was important as a dramatist and even more as a poet. He developed in his first poems a new aspect of metaphysical approach. He became the leader of a generation which looked for the truth beyond the confines of a narrow materialism and social compassion, the same movement which later developed into

FRANZ WERFEL

expressionism (*q.v.*). His main problem was always the observation and description of the individual human soul. Although he preached the "revolt of youth," he did so not for the sake of revolution but to protest against materialistic ideas. From "The Forty Days of Musa Dagh" (1934), the work which established his reputation in the U.S., to "Embezzled Heaven" (1940), "The Song of Bernadette" (1942), and his posthumous work, "The Star of the Unborn" (1946), he glorified the values of humility and sincere piety against intellectual conceit. A firm believer in Christ and His mission on this earth, he, a Jew, never became converted to Catholicism although emotionally and intellectually he drew very near to it. He expressed his reasons for not actually embracing Catholicism, which he felt to be the principal tragedy of his life, in a philosophical-theological work, "Between Heaven and Earth" (1940).

Werner (*vĕr′nẽr*), ALFRED, chemist, born Dec. 12, 1866, in Mulhouse, Alsace; died Nov. 15, 1919, in Zurich, Switzerland. He was educated at the technical high schools of Karlsruhe and Zurich and remained in Zurich to become an assistant at the Zurich Polytechnic Institute. He taught at the Coll. of France in Paris for several years but by 1893, back in Zurich, became extraordinary professor of chemistry at the university. Two years later he became professor of chemistry there and he remained with that institution until his death. Werner developed the co-ordination theory of valency, thus making it possible to classify complex inorganic compounds. In 1913, he won the Nobel Prize for chemistry "in recognition of his works on the linking up of atoms within the molecule, whereby new light has been thrown upon older fields of research, and new fields have been opened up, especially within the realm of inorganic chemistry."

Wertheimer (*vĕrt′hī-mẽr*), MAX, psychologist, born Apr. 15, 1880, in Prague, Czechoslovakia; died Oct. 12, 1943, in New Rochelle, N.Y. He taught at the Univ. of Berlin (1918-29) and at the Univ. of Frankfort on the Main (1929-33). In 1933, he left Germany for the U.S., where he taught at the New School for Social Research, New York, until his death. Together with Wolfgang Kohler and Kurt Koffka, Wertheimer was the founder of the psychological concept of Gestalt (*q.v.*) and of the so-called Gestalt theory, which they discovered and publicized after a series of psychological experiments made immediately before World War I. According to them, the original sensory organization, as well as the more complex higher and intellectual associative processes of mind, are based on the *a priori* perception of Gestalt (configurative pattern) of organized wholes. The structure of these wholes is not composed of various elements built up to a greater entity; the entity exists *a priori*. This Gestalt theory is the exact opposite of that held by the associationists.

Weser (*vā′zẽr*), a river of Germany, which is formed by the Fulda and Werra Rivers a short distance southwest of the Hartz Mts., and after a course of 260 m. toward the northwest, flows into the North Sea. A canal connects it with the Elbe. Bremen and Bremerhaven are the chief cities on its banks. The tributaries include the Aller and Hunte.

Wesley (*wĕs′lĭ*), CHARLES, clergyman, born in Epworth, England, Dec. 18, 1708; died Mar. 29, 1788. He was a brother of John Wesley and was educated at Westminster School and Oxford Univ. From 1735-36 he was with his brother John in Georgia, where he served as secretary to Gov. Oglethorpe. He returned to England in the latter year and assisted his brother in evangelistic work and in establishing the Methodist faith. Though not gifted with the personal magnetism and oratorical power of his brother, he served the movement well by writing numerous beautiful hymns. Many of his songs rank among the best in the English language. They include the immortal hymn, "O, For a Thousand Tongues to Sing!" The total number of hymns written by him is given at 6,100, of which about 2,000 were left in manuscript. He published "Sermons with Memoir."

Wesley, JOHN, famous English clergyman and founder of Wesleyan Methodism, born in Epworth, England, June 17, 1703; died in London, Mar. 2, 1791. His father, Samuel Wesley (1662-1735), was a clergyman at Epworth and a distant relative of Arthur Wellesley, Duke of Wellington. He entered Charterhouse School in 1714 and was graduated from Oxford Univ. in 1724. He was made a fellow (1726) at Lincoln Coll., Oxford, became a pastor (1728), and joined the colonists in Georgia as a preacher and missionary in 1735. After spending two years in America, he returned to England, where he became interested in studying the doctrine of the Moravians. He had been impressed with the views of the Moravians while on his journey to America, and in 1738 visited Herrnhut, the Moravian settlement in Germany. While there he was influenced in several matters of faith by Nicholas Zinzendorf (*q.v.*).

Wesley began holding open-air meetings in 1739, in which he was associated with George Whitefield (*q.v.*). However, he soon separated himself completely from the doctrines of Zinzendorf and also from the followers of Whitefield. Thousands of earnest listeners attended his meetings, which were always made interesting by fine singing and an earnest and able exposition of Bible truths. He not infrequently delivered 800 sermons a year, and it was said that he delivered more than 50,000 during his lifetime. His success in arousing thought may be attributed to his personal magnetism, powerful oratory, and methodical plans and perseverance in carrying forward his work. His brother, CHARLES WESLEY, soon joined him in the work that led to the founding of the Wesleyan Methodist faith, the name *Methodism* being derived from the strict and methodical habits of his sympathizers. He ruled and administered his religious groups as long as he lived, and during this time no ministers were appointed by any group without his consent.

JOHN WESLEY

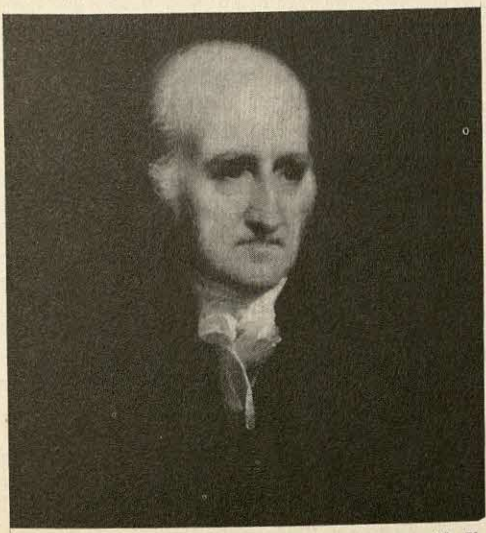
In 1750 he married Mrs. Vazeille, a widow with four children, but the union did not prove a happy one and separation finally followed. He wrote many works on religious themes, published a number of original hymns, and translated several songs from the German. Though the founder of a distinct faith, he never formally separated from the Church of England. His chief writings include "A Calm Address to Our American Colonies," "Notes on the Old and New Testaments," "The Doctrine of Original Sin," "Survey of the Wisdom of God in Creation," and "Preservative Against Unsettled Notions in Religion."

His brother, Charles, who wrote more than 6,000 hymns, some of which are still sung in all Protestant churches, became the poet of Methodism; John Wesley, a scholar of great grammatical and linguistic knowledge, was its intellectual founder. Methodism was to him less a new religious system than a revival (*q.v.*), an intensification of Christian thought and feeling. Therefore, the influences of the Moravians and of Luther, whose significance for his own thoughts he discovered only later, were of utmost importance to his thinking. The mere fact that Wesley did not separate from the Church of England proves that questions of doctrines and dogma were of less importance to him than intensity, truthfulness and practical exercise of Christian belief. It is the intensity of faith and not any basic theological doctrine which distinguishes Methodism from other Protestant sects.

Wesleyan University (*wĕs′lĭ-ạn û-nĭ-vẽr′sĭ-tў*), an institution of higher learning for men, located at Middletown, Conn. Established in 1831 under the patronage of the Methodist Episcopal Church, the college is nonsectarian in spirit, and is devoted to education in the liberal arts. Courses of study include languages, literature and the fine arts, philosophy and social science, mathematics, and the natural sciences. Wesleyan was a coeducational institution from 1872 to 1912. The college has an endowment of about $9,000,000, a faculty of more than 80, and a student body of about 900. The property is valued at more than $5,000,000, and the library contains about 400,000 volumes.

West (*wĕst*), BENJAMIN, painter, born in Springfield, Pa., Oct. 10, 1738; died in London, England, Mar. 11, 1820. He was descended from a family of Quakers. His first painting was a portrait of a baby sister lying in the cradle, which he executed when only seven years old, using colors made from berries and a brush of hairs taken from a cat's tail. In 1756 he established himself as a portrait painter in Philadelphia, but soon after moved to New York, where he attained considerable success. He went to Italy in 1760 to study art, and in 1763 settled in London as a portrait and historical painter. There he was liberally patronized by many famous men, including George III, who made him his historical painter. He joined three other painters in 1768 in founding the Royal Acad., of which he became president in 1792, an office which he held for 28 years. Most of his paintings are historical, but he painted many scenes based on the Scriptures and a large number of portraits. The entire productions somewhat exceed 400. He painted "Christ Healing the Sick" at the age of 65; the picture was purchased by the British Institution for $15,000. Other paintings of note include: "The Return of the Prodigal Son," "Hector and Andromache," "The Death of Gen. Wolfe," "The Battle of La Hogue," "Death on the Pale Horse," "The Crucifixion," and "Agrippina."

West, REBECCA, pseudonym of *Cicily Isabel Fairfield,* novelist and critic, born Dec. 25, 1892, in County Kerry, Ireland, of English parents. Educated in Edinburgh, she has written since childhood, also using the pseudonyms *Lynx* and *Corinne Andrews.* Her father was an army officer and a war correspondent; her mother was a musician and Rebecca herself was on the stage briefly when she was 17 years old. In 1930 she married Henry Maxwell Andrews. She is a writer of distinguished prose style and with excellent satirical and critical powers. Her novels include: "Return of the Soldier" (1918); "The Judge" (1922); "Harriet Hume" (1929); "War Nurse" (1930); and "Thinking Reed" (1936). Her critical work, mostly in the form of book reviews which appeared in the *New Statesman, New Republic,* and other journals, has been published as: "Henry James" (1916); "Strange Necessity" (1928); "D.H. Lawrence" (1930); "Arnold Bennett, Himself" (1931); "Ending in Earnest" (1931); "Letter to a Grandfather" (1933); and "St. Augustine" (1933). Her recent work has consisted of factual reporting, *e.g.,* the two-volume "Black Lamb and Grey Falcon" (1941), an astute and moving account of the land and people of Yugoslavia as imminent victims of the German army, and "The Meaning of Treason" (1947), a report of the British treason trials which followed World War II. During World War II she supervised the British Broadcasting Corp. short-wave talks to Yugoslavia.



Courtesy Metropolitan Museum of Art, N. Y.

BENJAMIN WEST

Self-portrait

Courtesy Viking Press, N. Y.

REBECCA WEST

Drawing by George Schreiber

West Africa (*wĕst ăf′rĭ-ḳȧ*). See *Angola; British Commonwealth of Nations; French West Africa; Liberia; Portuguese Guinea.*

West Allis (*wĕst ăl′ĭs*), a city in Milwaukee County, Wisconsin, located on the western outskirts of Milwaukee. It is served by the Milwaukee and the Chicago and North Western R.R.'s. The city has many schools, public libraries, and churches representing several denominations, and is the home of the Wisconsin State Fair and Wisconsin's largest amusement park. Noteworthy buildings include the city hall, two high schools, and a vocational school. The principal manufactures are farm implements, turbines, electrical machinery, mining equipment, tractors, motor trucks, castings, forgings, heating and air-conditioning equipment, diesel engines, tools, and foodstuffs. West Allis became a city in 1906. Population, 1940, 36,364; in 1950, 42,959.

Westborough (*wĕst′bŭr-ō*), or WESTBORO, a town in Worcester County, Massachusetts, 12 m. E. of Worcester, on the Boston & Albany R.R. The principal buildings include the Lyman School for Boys, a state industrial school, Westboro State Hospital for the Insane, and a public library. The manufactures include textiles, underwear, hats, corrugated paper, leather, abrasives, tape, bread, grinding wheels, and electrical and harvesting machinery. The first settlement in its vicinity was made in 1569, when the town became known as Chauncy; it was incorporated as Westborough in 1717. Population, 1950, 7,378.

Westbrook (*wĕst′brŏŏk*), a city in Cumberland County, Maine, 6 m. N.W. of Portland, between the Presumpscot and Stroudwater Rivers. It is served by the Maine Central and the Boston & Maine R.R.'s. The chief industries are papermaking, cotton textiles, shoes, and machinery. Westbrook was incorporated as a town in 1814 and as a city in 1891. Population, 1950, 12,284.

West Chester (*wĕst chĕs′tẽr*), county seat of Chester County, Pennsylvania, 27 m. W. of Philadelphia. It is served by the Pennsylvania R.R. and the Philadelphia Suburban Transportation Co. West Chester is surrounded by a rich farming and dairying region. Among the manufactures are springs, fire-fighting foam, air compressors, farm refrigerating and dairy equipment, hosiery, wheels, growing and canning of mushrooms, penicillin, and tags. The noteworthy buildings include the Chester County Historical Society, the Turk's Head Inn, built in 1747, and a state teachers college. Within a radius of a few miles are such places of historical interest as Brandywine Battlefield and Valley Forge. West Chester was founded in 1713 and incorporated as a borough in 1799. Population, 1900, 9,524; in 1940, 13,289; in 1950, 15,168.

Westerly (*wĕst′ẽr-lĭ*), a town in Washington County, Rhode Island, on the Pawcatuck River, 5 m. N. of Long Island Sound. It is on the New York, New Haven & Hartford R.R. In the surrounding country are extensive quarrries, which produce the well-known *Westerly granite*. Among the features are a number of historic buildings, including the old town hall, the Union Meetinghouse, and the colonial Joshua Babcock House. Westerly manufactures textiles, granite products, printing presses, clothing, and machinery. First known as Misquamicutt, Westerly was incorporated in 1669. Population, 1950, 8,415.

Western Australia (*wĕst′ẽrn ạ-strāl′yȧ*), the largest state of the Commonwealth of Australia, comprising the entire western third of the continent. It is bounded on the N. by the Timor Sea, on the W. by the Indian Ocean, and on the S. by the Southern Ocean and the Great Australian Bight. The eastern boundary is formed by South Australia and the Northern Territory. The length from north to south is about 1,450 m., the breadth is 950 m., and the area is 975,920 sq. m.

DESCRIPTION. The surface is undulating, but the general elevation is not high above the sea. Much of the surface consists of sand or sandstone plateaus. Fertile regions lie along the coast and in the southwest, where vegetation is extensive, but the interior is largely desert-type country. Several mountain ranges diversify the surface, including the Darling, King Leopold, Hamersley, and Stirling ranges, but their heights do not exceed from 2,500 to 4,024 ft. The Kimberley District, in the northern part, consists of elevated plains through which deep ravines have been cut by the action of streams. As a whole the coast is quite regular, with small indentations, such as Shark's Bay, Exmouth Gulf, and King Sound. Many small islands lie off the coast.

The drainage is chiefly toward the west. Rainfall in the interior is so scant that it does not exceed the natural evaporation, so that the water sinks into the ground or is carried by short streams into lakes that have no outlet. Among the chief rivers are the Ord, the Fitzroy, the DeGrey, the Ashburton, the Gascoyne, and the Murchison. Many salt lakes are located in the west central part, but none of them has an outlet to the sea. These include Carey, Barlee, and Moore Lakes. Sterile tracts of sandy wastes and numerous salt marshes abound in the region of the lakes, but many sections contain good grazing lands. Most of the lakes become mud flats during the dry season, when they are covered with beds of salt.

The climate in general is one of the most temperate in the world and it is healthful and pleasant. Slight frosts occur in winter. The summer heat is usually from 70° to 90°, though the thermometer may rise to 112°. Rainfall is from 6 to 10 in. in the interior, but along the coast it ranges from 15 to 40 in. A scarcity of precipitation renders it almost impossible to provide wells in many parts of the interior, thus necessitating the construction of cisterns to preserve water for the dry season, or the movement of stock toward the coastal districts. Fine forests, largely hardwood, abound in the southwestern section, where many trees attain an enormous size, such as the sandalwood, karri, tuart, and eucalyptus. Jarrah and karri are the two chief timbers and Western Australia has the largest timber export industry of the continent. Other trees include the baobab, red gum, pepper bark, mangrove, and grass trees.

MINING. The state is rich in mineral deposits. The most significant economic event in the history of Western Australia was the discovery of gold, first in the Kimberleys in 1885, followed by discovery in the Murchison, Yilgarn, and Coolgardie districts in 1891 and finally in Kalgoorlie in 1893. The Golden Mile of Kalgoorlie, "the richest square mile of mineral country in the world," has produced over £125,000,000 worth of gold. The influx of gold hunters increased the population of the state from 58,658 in 1892 to 138,000 in 1896. Other minerals of great importance are coal, copper, tin, lead, silver, and arsenic. The potential wealth in minerals already being extracted and those not yet developed is very great.

AGRICULTURE. The arable portion of Western Australia is better adapted to agriculture and stock-raising than any other part of the continent, because there rainfall is certain. However, progress in these enterprises has been made chiefly along the southwestern coast, since the vast interior does not have sufficient moisture to mature the crops. Farming has developed materially since the mining interests have extended. Wheat is the leading cereal and both wheat and oats are cut to some extent for hay. Other products include tobacco, barley, sugar beets, rye, vegetables, and fruits. Large areas are suitable for grazing, but the pastoral industry is seriously limited on account of the difficulty in obtaining water. Sheep are raised more extensively than any other class of domestic animals, but interests in cattle and horses are large. The culture of silk and the mulberry tree has been introduced successfully.

Transportation. None of the rivers is navigable and few harbors are afforded by the coast. Railroad building has been confined chiefly to the southwestern part, with Perth the leading railway center. The lines of railways in operation include a total of 4,381 m., the larger part of which is owned and operated by the government. Highways have been built in the more generally settled portions. Telephones are in general use and the telegraph lines cover thousands of miles. The exports include minerals, pearls, timber, wool, cured and canned fish, cereals, livestock, and hides. Among the leading imports are clothing, tea, chemicals, spirits, and machinery.

Manufactures. The manufacturing enterprises are connected largely with the mines and lumber industries. Flour and grist are produced extensively and considerable interests are vested in canning fruits and fish and in tanning hides. Extensive machine shops are located at Perth, but these are devoted chiefly to the manufacture of implements and to reconstruction and repair of railway equipment. Among the general manufactures are clothing, pottery, canned fruit and fish, cigars, furniture, and clothing.

Government. The governor is appointed by the British crown, and he exercises general executive power through a responsible ministry. Legislative authority is vested in a parliament of two branches, the legislative council of 30 members and the legislative assembly of 50 members. Representatives in both departments are elected by popular vote without distinction of sex, the councilors for six years and the assemblymen for three years. The right of suffrage is based upon a property qualification. Local government is administered by counties, municipalities, and towns.

Education. Public schools are maintained in all the settled portions, at which attendance is free, and compulsory between the ages of 6 and 14. Instruction in the public schools is secular, but religious training may be given by clergymen of the same denomination as the parents of the children. Numerous secondary schools are maintained in the larger towns. Perth is the seat of the university. A number of parochial schools and educational associations of various kinds are in a flourishing condition.

History. The western coast of Australia was first visited by the Portuguese in the 16th century. Dutch explorers surveyed the northern coast about a century later. In 1825, the first settlement was established within the present confines of Western Australia by the English, who took official possession of the region two years later. Large grants of land were made to companies in 1829, with the view of colonizing the country, and several thousand convicts from Sydney came with the early settlers. The discovery of gold, in 1885, brought a large number of prospectors to the Kimberley District, and after 1890 the immigration became extensive. Western Australia long opposed the formation of the Commonwealth of Australia, but it finally joined the commonwealth on Jan. 1, 1901.

Population. The state is one of the most sparsely settled regions in the world. Nearly all the settlements are confined to the coast and in the mining districts. Most of the inhabitants are British or of British descent, and the Anglican Church has a larger membership than any other. Among the leading denominations, besides the Anglicans, are the Roman Catholics, Methodists, and Presbyterians. Perth, in the southwestern part, is the capital and largest city. Other cities include Fremantle, Kalgoorlie, Coolgardie, Bunbury, Geraldton, and Albany. Population, *ca.* 491,579.

Western Church (*wĕst′ẽrn chûrch*), name for the Roman Catholic Church (*q.v.*) which recognizes the Pope as the Vicar of Christ.

Western Reserve University (*wĕst′ẽrn rē-zẽrv′ ū-nĭ-vẽr′sĭ-tȳ*), a coeducational institution of higher learning at Cleveland, O. Chartered in 1826 at Hudson, O., as a college for men, it was the first educational foundation in the Western Reserve of Connecticut. In 1844, the School of Medicine (formerly Cleveland Medical Coll.) became the medical department of the college. In 1882 Western Reserve Coll. was moved to Cleveland and the name was changed to Adelbert Coll. of Western Reserve Univ. To this new corporation the college deeded its department of medicine. On July 1, 1941, these two corporations and the Cleveland School of Architecture were legally consolidated under the name of Western Reserve Univ. An arts college for women, known as Flora Stone Mather Coll., was established by the university in 1888. Schools of pharmacy, law, dentistry, library science, applied social sciences, nursing, architecture, education, and graduate studies were gradually incorporated into the university. Extensive libraries, laboratories, and research facilities make it a center for scholarship. Western Reserve Univ. has a faculty of about 700 and an annual enrollment of more than 15,000 students.

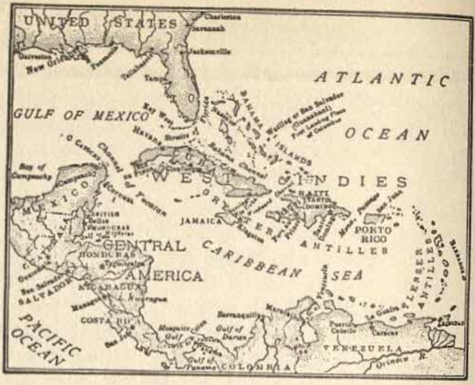
Westfield (*wĕst′fēld*), a city in Hampden County, Massachusetts, 9 m. w. of Springfield, on the Westfield River. It is served by the Boston & Albany and the New York, New Haven & Hartford R.R.'s, as well as by several highways and the Barnes Airport, which quarters a U.S. Civil Aeronautics Authority and a weather bureau. The noteworthy buildings include the Westfield State Teachers' Coll., Westfield Athenaeum (a public library), Noble Hospital, and Westfield State Sanatorium. Among the manufactures are paper products, textile machinery, lumber, bricks, celluloid products, thread, bicycles, boilers, radiators, and prefabricated houses. Westfield has several printing plants, a flower and shrub nursery, and marble and rock quarries. The place was settled in 1642 and became a town in 1669. It was incorporated as a city in 1921. Population, 1940, 18,793; in 1950, 20,962.

Westfield, a town in Union County, New Jersey, 7 m. w. of Elizabeth on the Central of New Jersey and the Baltimore & Ohio R.R.'s. It is a residential center. Population, 1950, 21,243.

West Haven (*wĕst hā′v′n*), a town in New Haven County, Connecticut, separated from New Haven by the West River. Served by the New York, New Haven & Hartford R.R., it is a popular residential center. The principal buildings include the Peter Mallory House, which is dated 1695, the Ward Heitman House, built in 1684, and the home of Gen. Tom Thumb, Barnum's famous midget. Among the manufactures are fertilizer, automotive products, and safes. The town was the scene of a British raid in 1779. A part of New Haven until 1822, when it was united with New Milford, West Haven was organized as a town in 1921. Population, 1950, 32,010.

West Indies (*wĕst ĭn′dēz*), or ANTILLES (*ăn-tĭl′ēz*), an island archipelago of America, extending from the extremity of Florida to the northern coast of Venezuela. It lies between the Gulf of Mexico and the Caribbean Sea on the west and the Atlantic Ocean on the east. About 1,000 islands are included in the group, ranging from small islets to Cuba, the largest of the islands. The archipelago may be divided into four groups: the Greater Antilles, the Lesser Antilles (including the Leeward, Windward, and Caribee Islands), the Bahama Islands, and the Virgin Islands. Since these groups and a number of the more important islands are described in special articles, this article merely calls attention to only a few general characteristics.

The Greater Antilles comprise the four largest islands of the West Indies, including Jamaica, Puerto Rico (formerly Porto Rico), Haiti, and Cuba. The Lesser Antilles lie between the northeastern part of Venezuela and Puerto Rico, forming an extensive chain of islands and islets. On the other hand, the Virgin Islands (formerly the Danish West Indies) form a connecting link between the Greater and Lesser Antilles, lying northeast of Puerto Rico. The Bahama Islands are southeast of Florida. These islands lie within the Torrid Zone, except the Bahama group, which is situated mostly north of the Tropic of Cancer. The land area is estimated at about 100,000 sq. m., and of this land surface about 82,575 sq. m. are included in the Greater Antilles.



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WEST INDIES

The West Indies are largely of volcanic origin, probably embracing the summits of a submerged mountain system, but the Bahamas and a number of individual islands are of coral formation. The latter are generally low and level, but those of volcanic origin have peaks towering from 5,000 to 8,550 ft. above sea level. Marked differences prevail in the climatic conditions of the islands, largely because of variance in elevation and latitude. Those islands having an elevated surface are generally favorable in climate, but those lying near sea level are excessively hot in summer. Hurricanes and storms are quite frequent. Insects, reptiles, and birds are found in abundance and diversity of species. The archipelago as a whole has considerable mineral wealth in gold, silver, lead, coal, iron, copper, tin, manganese, limestone, and granite. Among the chief agricultural products are tobacco, cotton, sugar, rum, coffee, maize, potatoes, yams, pineapples, lemons, oranges, citron, pomegranates, manioc, indigo, pepper, aloes, sassafras, and other tropical products. Horses, cattle, sheep, swine, mules, and poultry are raised in abundance. The islands yield large quantities of valuable timber.

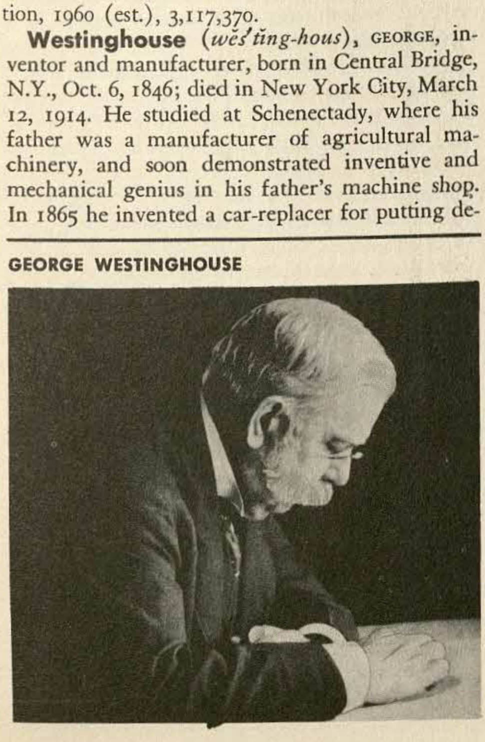
Columbus first saw land in America on discovering San Salvador, an island of the West Indies (so called since they were believed to be a part of India). The archipelago was named by a company of Dutch traders, who believed them to be the East Indies. Carib and Arawak Indians inhabited the islands at the time of the discovery, but they were largely exterminated by the Spaniards. Since slave labor was profitable on sugar and tobacco plantations, many Africans were imported.

Today's population is descended chiefly from the early natives, Africans, and Spaniards. Spain gradually lost influence in the islands, surrendering Cuba and Puerto Rico in 1898 (see *Spanish-American War*). Cuba, the Dominican Republic, Haiti, Trinidad, and Jamaica are independent; Puerto Rico is a commonwealth associated with the U.S. The U.S. bought the Virgin Islands from Denmark in 1917. Martinique and Guadeloupe are overseas departments of France. The Dutch islands, including Curaçao, constitute the Netherlands Antilles. Venezuela owns Margarita. A number of the British islands were federated from 1958 to 1962 (see *West Indies, The*). Total population of the islands of the West Indies, 1960, *ca.* 20,000,000.

West Indies, THE, a one-time federation in the Caribbean of the British colonies of Antigua, Barbados, Dominica, Grenada, Jamaica, Montserrat, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent, and Trinidad and Tobago (*qq.v.*), formed in January 1958, with membership in the (British) Commonwealth of Nations, and lasting until 1962. The area was 8,028 sq. m. and Trinidad was the seat of government. Both Jamaica and Trinidad chose to become independent outside the federation, however, so in May 1962 it was dissolved. Jamaica gained its independence on Aug. 6, 1962, and Trinidad and Tobago on Aug. 31. The remaining eight colonies are expected to form a new federation sometime in 1964. Population, 1960 (est.), 3,117,370.

Westinghouse (*wĕs′tĭng-hous*), GEORGE, inventor and manufacturer, born in Central Bridge, N.Y., Oct. 6, 1846; died in New York City, March 12, 1914. He studied at Schenectady, where his father was a manufacturer of agricultural machinery, and soon demonstrated inventive and mechanical genius in his father's machine shop. In 1865 he invented a car-replacer for putting derailed freight cars onto the tracks, and in 1868 he developed a railroad frog. His greatest achievement was the invention of the famous Westinghouse air brake (*q.v.*), which he afterward greatly improved, and which for the first time made high-speed railway travel safe. He invented several steam and gas engines, steam turbines, and safety devices useful in railroading. He later became interested in electricity and acquired patents on electrical alternating-current machinery, by which it became possible to develop the use of water power for long-distance transmission, and which led to the establishment of the great generators at Niagara Falls and elsewhere. He established workshops for the manufacture of air brakes and electrical and steam machinery in France, Germany, and Great Britain. Many governments and numerous scientific societies bestowed honors upon him.

GEORGE WESTINGHOUSE



Westminster Abbey (*wĕst′mĭn-stẽr ăb′ĭ*), England's most famous church, located in the borough of Westminster, in the center of London. The abbey is outstanding as one of the best examples of English Gothic architecture; it is the burial ground of Britain's most famous men and women, as well as of the Unknown Warrior. Many interesting monuments can be found in the so-called Poets' Corner (including those of Chaucer, Spenser, and Dickens) and in the Choir Chapels. It is also the site of the oaken coronation chair (*q.v.*), and in the abbey all English kings and queens since 1066, with the exception of Edward V (the murdered "prince in the tower") and Edward VIII, have been crowned.

A Christian church had been erected in the 6th century on this site, which was traditionally occupied by a Roman temple to Apollo. The actual abbey church was founded in the 11th century by Edward the Confessor. The present building owes its appearance to Henry III, from the middle of the 13th century, under whom—especially—work on the Lady Chapel was started. The cloisters connected with the abbey stem from the middle of the 14th century, whereas the main portion of the nave and the Chapel of Henry VII, with its magnificent fan-vaulting, were built between the 14th and 15th centuries. This gradual development of the whole complex structure explains the stylistic variety of its architecture—from early Gothic to the late Perpendicular period which terminated the Gothic style in England. The towers were designed in the 17th century by Sir Christopher Wren.

The nave of Westminster Abbey is 166 ft. long and 101.66 ft. high. Its breadth, together with the aisles, is 71.75 ft. The total exterior length of the abbey, including Henry VII's Chapel, is 530 ft. The towers are 225 ft. high. During World War II the structure was damaged by German air raids, but restoration has been almost completed. Other famous parts of the abbey are the chapter house and the Chamber of the Pyx.

Westminster Hall (*hạl*), the large hall of the former palace of Westminster, now used as a vestibule to the British Houses of Parliament, in London, England. It was built in 1097 and was rebuilt in its present form by Richard II, in 1399, when it also received its magnificently carved oaken roof. As the structure now stands, it is 68 ft. wide, 90 ft. high, and 290 ft. long. It is the site where Richard II was deposed, Charles I received his death sentence, and the trials of Warren Hastings, Sir Thomas More, and Lady Jane Grey were held. Here Cromwell was installed as Protector. The hall has served for many great public festivals, especially ceremonies connected with the coronation of English rulers. The structure was damaged during the German air attacks of 1940-41. See also *Parliament.*

Westminster (*wĕst′mĭn-stẽr*), STATUTE OF. See *Imperial Conference.*

Westmorland (*wĕst′môr-lạnd*), a northwestern county of England, bounded on the w. and N. by Cumberlandshire, N.E. by Durham, E. and S.E. by Yorkshire, s. and s.w. by Lancashire. The area is 788 sq. m. and the county town is Appleby. Kendal is the largest town, with about 18,000 inhabitants. The county reaches the Irish Sea through the Kent estuary to Morcambe Bay. Sheep raising is the chief rural occupation, while textile manufacturing at Kendal is the principal industry. The most sparsely populated county of England, Westmorland lies in the beautiful "Lake District" associated with the names of S.T. Coleridge, William and Dorothy Wordsworth, and Thomas De Quincey. Population, *ca.* 65,000.

Courtesy British Information Services, N. Y.

WESTMINSTER ABBEY

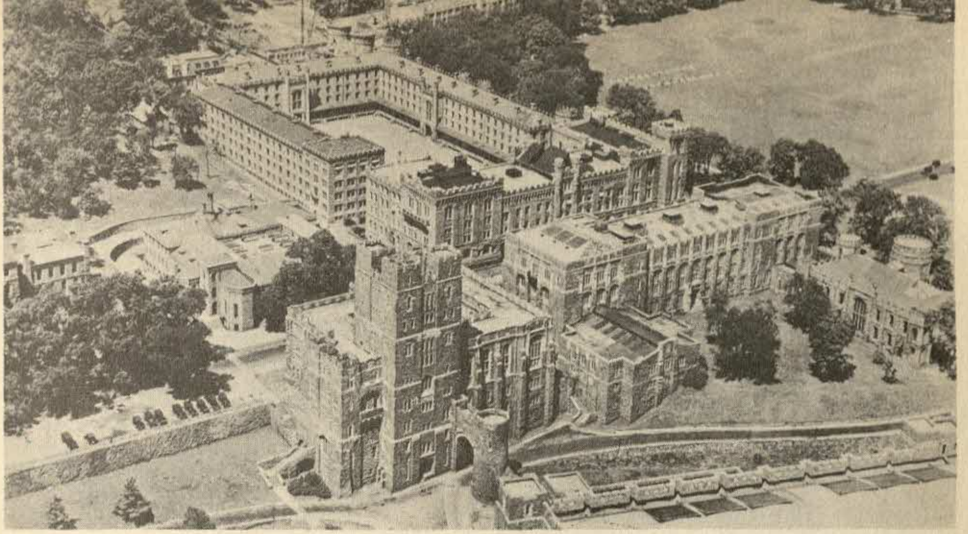
West New York (*wĕst nū yôrḳ*), a town in Hudson County, New Jersey, situated near Union City. The manufactures include smoking pipes, textiles, clothing, jewelry, machinery, and laces and embroideries. The town serves as a residential suburb of New York City. Originally a part of North Bergen, West New York was incorporated separately in 1898. Population, 1950, 37,683.

West Orange (*wĕst ŏr′ĕnj*), a town in Essex County, New Jersey, 12 m. w. of New York City. It is on the Erie and the Delaware, Lackawanna & Western R.R.'s. The town lies along the slope of Orange Mt. A fine view of New York City is afforded by Eagle Rock, an elevation of 600 ft. Llewellyn Park is a residential section with many fine homes. The manufactures include hats, boxes, clothing, office furniture, and electrical appliances. West Orange was incorporated in 1900. Population, 1950, 28,605.

West Palm Beach (*wĕst päm bēch*), county seat of Palm Beach County, Florida, 60 m. N. of Miami. Situated on the Atlantic coast, it is served by the Florida East Coast and the Seaboard Airline R.R.'s, also by the Eastern and National airlines. It occupies a beautiful site on the mainland opposite Palm Beach (*q.v.*). It is famous as a year-round resort. Commercial fishing is an important industry. West Palm Beach was incorporated in 1894. Population, 1950, 43,162.

Westphalia (*wĕst-fā′lĭ-ȧ*), a province of what was formerly Prussia, Germany, now a part of the *Land* North Rhine-Westphalia, lying E. of The Netherlands and s. of Lower Saxony. The area was 7,810 sq. m. The northwestern part has a level surface, while the southern part is largely of an undulating character, being formed of hills and valleys. Most of the province is highly fertile, especially the western part, which resembles the eastern portion of The Netherlands. It has extensive mineral deposits, especially coal and iron.

Westphalia has a large number of railroads, but transportation is also conducted by the Lippe and Ems Rivers and by several canals. The inhabitants are descendants of the Saxons, who settled here from the vicinity of the Elbe shortly after the beginning of the Christian era. Charlemagne added the region to his dominion, but shortly after his death it fell to the dukes of Lower Saxony. In 1179 it was made a part of the German Empire and until 1802 belonged to the Cologne electorate, when it came under the rule of the Hesse-Darmstadt family. Napoleon organized the kingdom of Westphalia, which included the present province of Westphalia and several adjacent districts, and placed his brother Jerome on the



U. S. Army Signal Corps Photo

AIR VIEW OF WEST POINT MILITARY ACADEMY

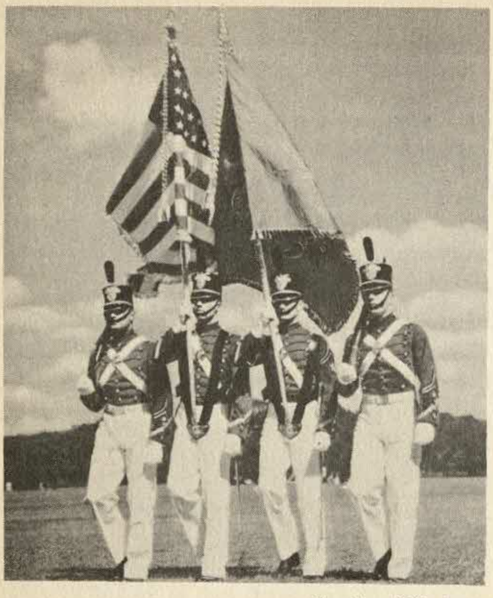
throne. The kingdom was abolished after the Battle of Leipzig and by the Treaty of Vienna the region was incorporated into Prussia. The Thirty Years' War was ended in 1648 by the Treaty of Westphalia, which was concluded at Münster and Osnabrück. Münster is the capital. During World War II, the U.S. Ninth Army entered the city of Essen on Apr. 9, 1945, and thus completed the capture of the province of Westphalia. It was later included in the British zone of occupation. Population of North Rhine-Westphalia, 1946, 11,797-106. See also *Rhine Province*.

West Pittston (*wĕst pĭts′tŭn*), a borough in Luzerne County, Pennsylvania, on the Susquehanna River, opposite Pittston. It is served by the Delaware, Lackawanna & Western R.R. Primarily a residential section, West Pittston is connected with Pittston by two bridges which span the river. Situated in the coal-mining and steel-manufacturing district, it manufactures machinery, cigars, and clothing. The borough was incorporated in 1857. Population, 1950, 7,230.

West Point (*wĕst point*), a military reservation of over 15,000 acres, situated in Orange County, New York, on the Hudson River, about 50 m. N. of New York City. It is served by the West Shore and the New York Central R.R.'s, and also by steamboats and bus lines. Situated high on the west bank of the Hudson, it offers a majestic view of the river and the adjacent hills, which tower from 475 to 1,500 ft. above sea level. West Point is the seat of the U.S. Military Acad., the national military academy of the U.S. The academy is situated on a lofty plateau on the west bank of the Hudson River. The primary mission of the academy is to instruct and train cadets for a lifetime career as officers of the regular army. West Point is commanded by the superintendent, usually a major general. The academic board has charge of scholastic and military education. The daily life of the cadets and all phases of cadet training are under supervision of the commandant of cadets, under whom the tactical officers supervise the purely military part of the training. The corps of cadets consists of approximately 2,500 men between the ages of 17 and 26, and is divided into four classes: the *Plebe*, or Fourth Class; the *Yearling*, or Third Class; the *Second Class;* and lastly, the *First Class*. The official motto of West Point is "Duty, Honor, Country." Many interesting trophies of various wars are located here. They include the 1,700-ft.-long Great Chain which was stretched across the river from Constitution Island to West Point during the revolution in order to block the Hudson to enemy water traffic. Other points of interest are the Cadet Chapel, the museum, Trophy Point, and the Battle Monument.

During the Revolutionary War, Gen. George Washington recognized the strategic importance of the site. On Jan. 20, 1778, U.S. troops were first regularly garrisoned at West Point, and a year later Washington made the post his headquarters. In 1780 Maj. Gen. Benedict Arnold (*q.v.*) was given command at his own request, and a month later Arnold agreed to surrender the fortifications to the British for $30,000. This scheme was averted by the capture of Maj. André (*q.v.*), a British officer.

The first suggestion of a military school at West Point was made by Col. Thomas Pickering, but the plan was postponed by the Revolution. In 1794 an Act of Congress authorized a corps of engineers and artillerists to garrison the forts permanently, and provided for the instruction of 32 cadets. In 1798 the corps was enlarged, and the number of students and instructors extended. By an Act of Congress in 1802 West Point was made the seat of the U.S. Military Acad. With the growth of the country's military importance, the



Courtesy U.S. Army

U.S. CADET CORPS COLOR GUARD

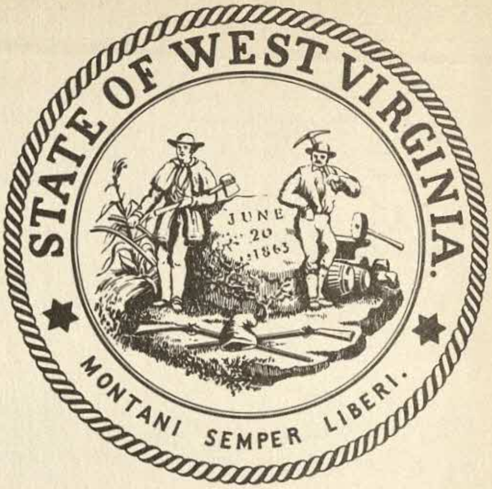
Showing "the colors" at the U.S. Military Academy, West Point, N.Y.

institution was constantly enlarged and the course of study extended. See also *Cadets*.

West Springfield (*wĕst sprĭng′fēld*), a town in Massachusetts, 98 m. S.E. of Boston. It is served by the New York Central R.R. Situated on the Connecticut River, opposite Springfield, it is popular as a residential center. Among the manufactures are clothing, machinery, chemicals, and hardware. The Eastern States Exposition, an important agricultural fair, is held here annually. The first settlement in the vicinity was made about 1655, and West Springfield was incorporated as a town in 1774. Shays' Rebellion broke out in this area in 1786. Population, 1950, 20,438.

West Virginia (*wĕst vĕr-jĭn′yă*), a state in the South Atlantic section of the U.S., a mountainous region rich in minerals, and strategically located close to an excellent network of natural waterways. West Virginia's rugged people are proud of their mountain home. Their ancestors, companions of Daniel Boone and other frontiersmen, turned a wilderness into one of the nation's outstanding industrial areas. Leading all other states in the production of coal, West Virginia is also important in the manufacture of steel, chemicals, and clay and glass products.

West Virginia is bounded on the N. by Maryland, Pennsylvania, and Ohio; on the E. by Pennsylvania, Maryland, and Virginia; on the S. by Virginia and Kentucky; and on the W. by Kentucky and Ohio. It ranks 41st among the states in size and 30th in population, according to the

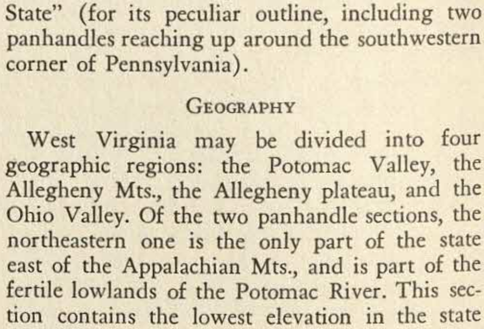

STATE OF WEST VIRGINIA.
JUNE 20 1863
MONTANI SEMPER LIBERI.

1958 estimates of civilian population (Alaska, Hawaii, and the District of Columbia included in both rankings). The state's name comes from that of Virginia, of which state it was a part until the Civil War. The state nicknames are the "Mountain State," and the "Panhandle State" (for its peculiar outline, including two panhandles reaching up around the southwestern corner of Pennsylvania).

GEOGRAPHY

West Virginia may be divided into four geographic regions: the Potomac Valley, the Allegheny Mts., the Allegheny plateau, and the Ohio Valley. Of the two panhandle sections, the northeastern one is the only part of the state east of the Appalachian Mts., and is part of the fertile lowlands of the Potomac River. This section contains the lowest elevation in the state (240 ft.), on the banks of the Potomac. The land slopes sharply upward where the panhandle joins the main body of the state. Farming is the main occupation of this region.

Crossing the state roughly in a southwest-to-northeast direction are three broad bands of terrain making up the other three regions. The



Location	Between 77°43′ and 82°39′ W. long. and 37°12′ and 40°38′ N. lat.
Area	24,181 sq. m.
Land	24,080 sq. m.
Inland water	101 sq. m.
Greatest extent:	
North to south	237 m.
East to west	265 m.
Population (1950)	2,005,552
Capital city	Charleston
Highest point	Spruce Knob (4,860 ft.)
Lowest point	Potomac River (240 ft.)
Admitted to the Union (35th state)	1863
Song	"West Virginia Hills," words by Ellen King, music by H. E. Engle
Flower	Rhododendron Maximum
Bird	Cardinal
Motto	*Montani Semper Liberi* (Latin, meaning "Mountaineers Are Always Free")
Flag	See color plate in Vol. XI

West Virginia section of the Allegheny Mts. is in the easternmost of these regions. This is a series of sharp ridges and narrow valleys, well timbered, with many springs and fast-flowing streams. West Virginia's highest peak, Spruce Knob, is in this section, with an elevation of 4,860 ft. Most of the other peaks are in the 4,000-ft. class, while the valley floors are at least 2,000 ft. above sea level.

West of the Allegheny Mts. is the Allegheny plateau, a highland that has been deeply carved by the mountain streams flowing to the Ohio River. This is hilly country, very rich in minerals, a treasure made more accessible by the cutting action of the rivers. There is not enough flat land here to allow for many large crop farms, but stock and dairy farms do well on the grass which the limestone-based soil produces. Elevations are between about 1,000 and 2,500 ft. on the plateau.

The westernmost section of the state is within the Ohio River valley. The highlands of the plateau flatten out here into low rolling hills running down to the banks of the Ohio River. This is a region rich in both soil and minerals, while its navigable rivers and cheap electric power have encouraged a great industrial complex.

Except for the Potomac Valley region, most of West Virginia is drained by the Ohio River. The Ohio itself forms most of the state's western border. Its principal tributaries are the Kanawha, the Little Kanawha, the Monongahela, the Big Sandy, the Coal, and the Guyandot rivers. The Potomac, in the northeast, and the New River, in the southeast, flow eastward toward the Atlantic Ocean.

West Virginia offers the visitor an opportunity to see its industries in action. One may see an exhibition coal mine at Bluefield, glass factories at Milton, Moundsville, and at Weston, sawmills at Rainelle and Elkins, a milk cannery at Huttonsville, a quarry at Harpers Ferry, textile mills at Wheeling, a tannery at Parsons, and commercial flower growing at Enterprise.

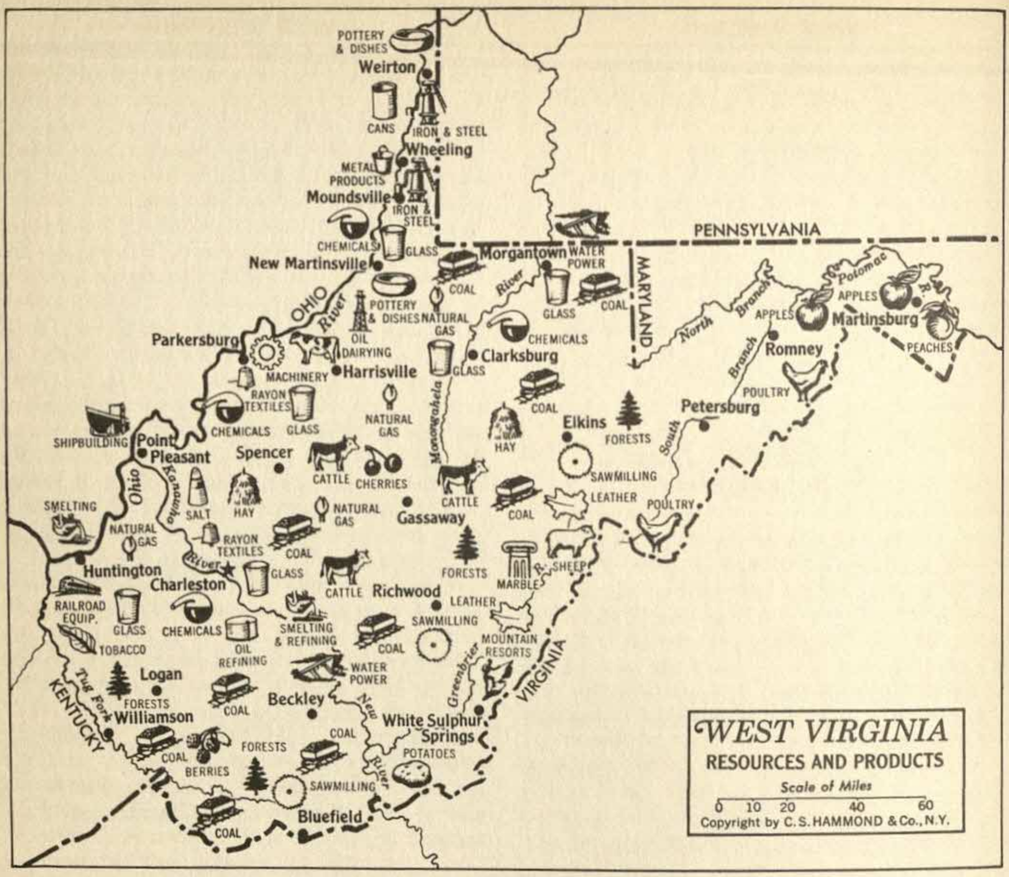
Historic spots include Blennerhassett Island, near Parkersburg, where Aaron Burr and the island's owner, Harman Blennerhassett, plotted treason. Historic sites also include Harewood, the home designed by George Washington for his brother Samuel, and Mordington, the home of Charles Washington, another brother—both at Charles Town. The farm and gristmill of "Stonewall" Jackson's family are preserved at Clarksburg. A monument at Tu-Endie-Wei Park, near Point Pleasant, commemorates the fierce struggle in 1774 between the frontiersmen and the Shawnee and Mingo tribes. Prehistoric Indian burial mounds are located at Moundsville. At Philippi is a wooden covered bridge, built in 1852, which was the scene of the first land battle of the Civil War, and which later bore troops and supplies for both sides. In White Sulphur Springs is a mineral-spring resort, famous since 1778.

Climate: West Virginia has a varied climate due to the differences in elevation. Winters are severe and summers short and cool on the mountain slopes and peaks. The climate of the sheltered valleys is less extreme. Rainfall is adequate for farming throughout the state, but both rain and snow fall more heavily in the mountain areas.

Normal temperature, Charleston	
January	36.4° F.
July	75.4° F.
Annual mean	55.8° F.
Latest frost, Charleston	May 11
Earliest frost, Charleston	Sept. 29
Precipitation, Charleston	
January	3.99 in.
July	5.45 in.
Annual	45.00 in.
Average growing season, Charleston	140 days

NATURAL RESOURCES

West Virginia has a treasure of natural resources. In 1956 the state ranked fifth among all the states in the value of minerals produced. A belt of bituminous coal underlies the greater part of West Virginia, extending through the center from the southern border up into the northwest panhandle. No other state produces more coal than West Virginia, yet the supply is estimated as enough to last for over 400 years at present rates of production—155,891,000 tons in 1956. The estimated coal reserve amounted to 105,000,000,000 tons in 1956. The coal, used as a fuel and as a source of steam-generated electric power, supports the steel industries of West Virginia and cities in nearby Pennsylvania and Ohio. The chemical industry derives a great variety of products from coal, including synthetic



fibers, artificial rubber, dyes, medicines, and plastics. Cheap water transportation is available to move the fuel to blast furnaces and other users. West Virginia was once an important producer of petroleum, but the supply of this fuel is running out. Natural gas, however, is plentiful; the state was the nation's seventh-largest producer in 1956. Large deposits of salt, in the form of salt water and rock salt, are an important asset to West Virginia's large chemical industry. Limestone is available in many locations in the eastern part of the state. West Virginia possesses some of the nation's highest-quality glass sand, molding sand for metal foundries, and pottery clay, which supports an important ceramic and glass industry.

ANNUAL STATE EVENTS

Winter Carnival	Winter months; Davis; sport and social events
Strawberry Festival	June; Buckhannon
Folk Festival	Late June or Early July; Glenville
State Fair	Usually mid-August; Lewisburg
Majorette Festival	September; Charleston
Preston County Buckwheat Festival	Late September or early October; Kingwood
Mountain State Forest Festival	Late September or early October; Elkins
Black Walnut Festival	Early October; Spencer

West Virginia forests contain valuable stands of timber, both pulpwood and saw-timber. About 10,000,000 acres of the state are forested, mostly with hardwoods. In 1952 the cut of saw-timber was 414,000,000 bd. ft.—390,000,000 of hardwoods and 24,000,000 bd. ft. of softwoods.

The valleys of West Virginia contain some excellent farm land. Stock raising and dairying flourish in the pasturage areas, while the hillsides grow fruits and berries.

Conservation activities in West Virginia include the supervision of factories to prevent the pollution of streams, the protection of wild game, and forest-fire prevention.

West Virginia's Economy

West Virginia is principally a manufacturing and mining state. The largest employment sector in 1950 was mining, which engaged 21 per cent of the total labor force of 628,272. The next-largest sector was manufacturing, with almost 19 per cent of the state's workers. Wholesale and retail trade together were third, with more than 15 per cent. Agriculture engaged about 10 per cent of the labor force.

West Virginia's largest industry is chemicals. In 1954 the value added by manufacture of chemical products was $316,922,000. Next in size was the primary-metals industry, especially blast-furnace production of steel. Value added by manufacture of primary metals in 1954 was $219,439,000. Third place was held by the stone, clay, and glass-products industry, whose value added by manufacture in 1954 amounted to $141,346,000. Other large West Virginia industries include manufacture of metal products and electrical machinery, the production of coke and coal by-products (such as coal tar and roofing), lumber milling and output of wood products, and food processing. In 1956 the total value added by manufacture was $1,207,000,000. In terms of value of output, therefore, manufacturing held first place in the state's economy.

In 1954 West Virginia had 68,583 farms, covering 7,352,000 acres, with 107.2 acres the average per farm. Livestock raising was the leading enterprise. Income from cattle, calves, veal, and beef was $18,310,000 in 1956. Dairying and poultry raising are also important. The income from broilers alone was $15,543,000 in 1956. West Virginia is the nation's sixth-largest apple-producing state, with a crop of 4,256,000 bu. in 1956. Other important products are corn, wheat, hay, tomatoes, peaches, strawberries, plums, and cherries. The 1957 cash income from crops, livestock, and government payments was $113,300,000.

The total value of West Virginia's mineral products in 1956 was $935,074,000, constituting 5.42 per cent of the total U.S. output.

TRANSPORTATION AND COMMUNICATION

West Virginia has three important navigable rivers, the Ohio, the Kanawha, and the Monongahela. Together, these provide over 350 m. of waterways and carry a great volume of bulky traffic such as coal and limestone. The Ohio River is second in the nation in volume of river traffic.

The first railroad in West Virginia was the Winchester & Potomac R.R. (1836), now a part of the Baltimore & Ohio R.R. Other major railroads include the Chesapeake & Ohio Ry., the New York Central R.R., the Norfolk & Western Ry., the Pennsylvania R.R., the Virginian Ry., and the Western Maryland Ry. Railroad mileage totaled 3,708 m. in 1956. In 1957 the state had 36,088 m. of roads, of which 22,972 m. were surfaced. All the major cities of the state have airfields. West Virginia had 58 radio stations and 11 television stations in 1957. The first paper in the state was the *Potomak Guardian and Berkeley Advertiser,* published at Shepherdstown in 1790. Among West Virginia's leading newspapers today are the Charleston *Gazette* and *Mail,* and the Huntington *Herald-Dispatch.*

POPULATION

West Virginia has 55 counties. The state's 1950 urban population comprised 34.6 per cent of the total population; the rural population, 65.4 per cent. Between 1940 and 1950, the urban population rose 19.9 per cent over that of 1940. The rural population declined (for the first time in the state's history) by 0.2 per cent. More than a seventh of the state's total population lived in the urbanized areas of Charleston, Wheeling, Huntington, and Ashland, Ky. West Virginia's population was estimated at 1,969,000 on July 1, 1958. In 1950 white persons numbered 1,890,282; of these, 1,855,696 were native born and 34,586 were foreign born. Nonwhite persons totaled 115,270, of whom 114,867 were Negroes. Population density in 1950 averaged 83.3 per sq. m.

The major religious faith in 1950 was the Protestant; there was a small Roman Catholic group and a very small Jewish group. The predominant Protestant bodies were The Methodist Church; the American Baptist Convention; the Presbyterian Church in the U.S.; the Evangelical United Brethren Church; and the Disciples of Christ, International Convention.

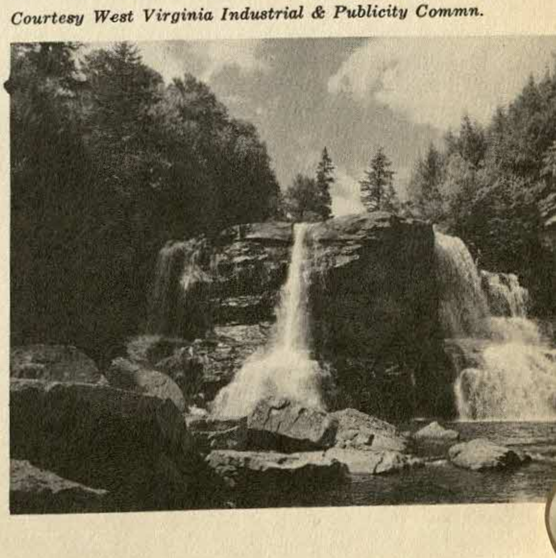
Chief Cities: Charleston, at the junction of the Elk and Kanawha rivers in the west central part of the state, is the state capital; a shipping and manufacturing center; and by reason of boundary changes in the late 1950's, the largest city.

Huntington, on the Ohio River in the west, is the state's second-largest city, a railroad

BLACKWATER FALLS, WEST VIRGINIA

The focal point of Blackwater Falls State Park, the 60-ft. falls mark the entrance to Blackwater Canyon

Courtesy West Virginia Industrial & Publicity Commn.



terminal, and a manufacturer of steel and glass products.

Clarksburg, on the Western Fork of the Monongahela River, is a mining, ceramic, and glass-making center.

Wheeling, on the Ohio River in the northwestern panhandle, manufactures steel products and chinaware and is a commercial center for nearby coal and natural gas.

Famous Men and Women: Baker, Newton Diehl (1871-1937), President Woodrow Wilson's Secretary of War (1916-21).

Buck, Pearl S. (1892-), missionary and Nobel Prize-winning novelist.

Davis, John William (1873-1955), statesman and political leader; Democratic candidate for President in 1924.

Gregg, William (1800-67), industrialist who started the movement of cotton mills to the South.

Jackson, Thomas Jonathan (1824-63), Confederate general, known as "Stonewall" Jackson, who was Gen. Lee's right-hand man.

Morrow, Dwight Whitney (1873-1931), lawyer, banker, and diplomat, who was ambassador to Mexico (1927-30), and the father of Anne Morrow Lindbergh.

Owens, Michael Joseph (1859-1923), inventor and manufacturer who developed machines for the mass production of glassware.

Rowan, Andrew Summers (1857-1943), army officer, the subject of Elbert Hubbard's famous essay, "A Message to Garcia."

EDUCATION

Education is free and compulsory for children between the ages of seven and 16. The state's public-school system was established in 1863. Public-school enrollment totaled 454,675 in 1957. At the time of the Supreme Court decision regarding desegregation, separate schools were maintained for white and Negro pupils. The leading state-supported institutions of higher learning are the Univ. of West Virginia, Morgantown; and West Virginia State Coll. (traditionally attended by Negroes), Institute. Private and denominational institutions of higher learning include West Virginia Wesleyan Coll., Buckhannon; Bethany Coll., Bethany; and Marshall Coll., Huntington.

Among cultural institutions is the State Museum in the capitol at Charleston, with historical exhibits including such items as Daniel Boone's rifle and Aaron Burr's spectacles; West Virginia University's Native Wildlife Museum; the Daywood Art Gallery, Lewisburg; and the Mound Museum of Indian relics, Moundsville.

GOVERNMENT

West Virginia is governed according to provisions of the constitution of 1872. Executive power is vested in a governor, lieutenant governor, secretary of state, treasurer, auditor, attorney general, superintendent of schools, and commissioner of agriculture, all elected for terms of four years. The governor cannot succeed himself. The legislature consists of a senate of 32 members, serving staggered terms of four years each; and a house of delegates of 100 members, elected every two years. The legislature convenes regularly on the second Wednesday of January in the odd-numbered years, for a session limited to 60 calendar days. The supreme court, called the supreme court of appeals, has five justices, elected for terms of 12 years. The judicial system also includes 24 circuit courts, inferior courts, domestic courts, courts of common pleas, criminal courts, and justices of the peace. West Virginia is represented in the U.S. Congress by two Senators and six Representatives.

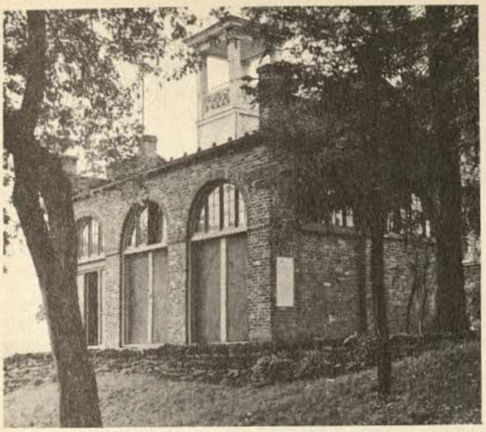
HISTORY

A hunting ground of the Shawnee, Delaware, Wyandot, and Cayuga tribes, West Virginia was first explored by white men in 1670. In that year, Gov. William Berkeley of Virginia sent a German surgeon and explorer, John Lederer, over the Blue Ridge Mts. to explore what was then the hinterland of the Virginia colony. At the same time, René Robert Cavelier, Sieur de La Salle, the French explorer, was traveling down the Ohio River in the western part of the present-day state.

During the years before the Revolution, a varied group of pioneers made western Virginia their home. Morgan Morgan built a single cabin at Bunker Hill in 1726, thereby becoming the land's first white settler. In the following year, a group of Pennsylvania Germans founded New Mecklenburg (now called Shepherdstown). Western Virginia also attracted the Scotch-Irish.

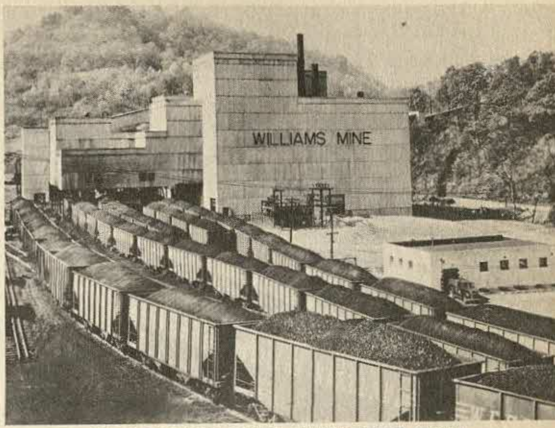
Between the frontiersmen of western Virginia and the plantation owners of the coastal section of Virginia there developed a great deal of friction. There was little love for the king among the westerners, many of whom did not speak or read English. Furthermore, the westerners did not make use of slaves as the easterners did, since the rugged terrain west of the Allegheny Mts. did not lend itself to a plantation economy. The frontiersmen also accused the easterners of not caring to help them against the ever-present threat of Indian raids.

After the Revolutionary War, the two halves of Virginia split even wider apart. The Ohio Valley became settled and the use of the Mississippi as an outlet to western trade was assured by the Louisiana Purchase. Instead of looking eastward to the Atlantic, the Virginians beyond the mountains sent their commerce to the west.



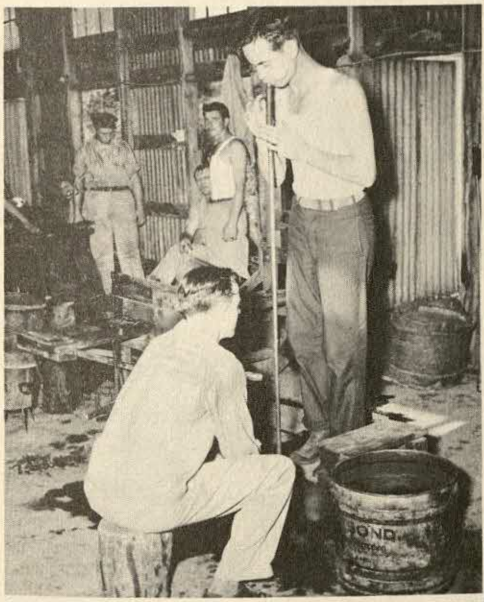
JOHN BROWN'S FORT AT HARPERS FERRY

Site of the famous raid of 1859, which increased Southern opposition to Northern abolitionists and helped pave the way for the creation of West Virginia



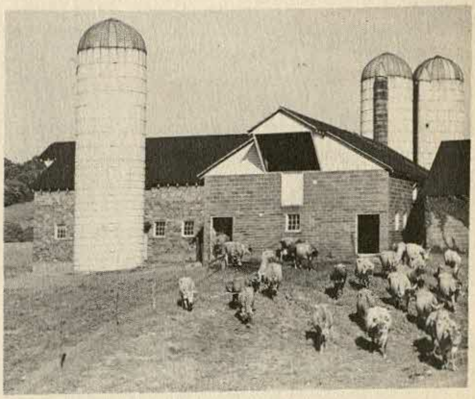
FREIGHT CARS LOADED WITH BITUMINOUS COAL

Mines like this, located all through the state, extract the ore which makes West Virginia the nation's leading producer of bituminous coal



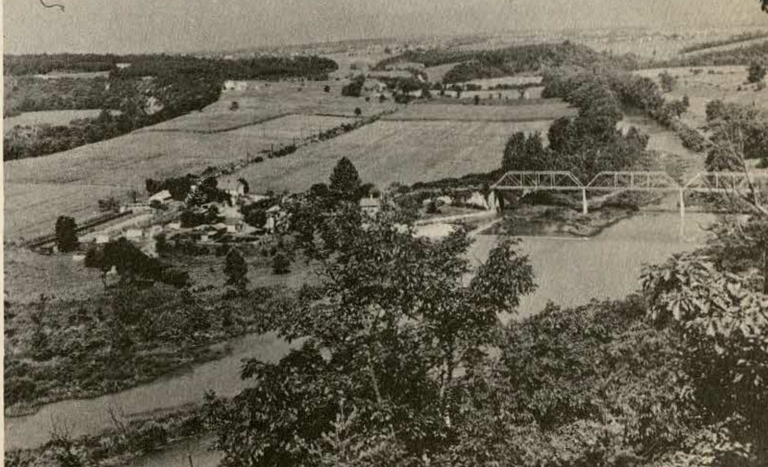
GLASS BLOWER AT WORK

The presence of high-grade sand and other essential materials has contributed to the growth of the glass and glassware industries, which are now among the important economic activities in the state



CATTLE HEADING FOR PASTURE

Dairying is an important pursuit for a predominantly rural population *(courtesy West Virginia Industrial & Publicity Comm.)*



THE SHENANDOAH VALLEY

These fertile farm lands were once the scene of important Confederate and Union campaigns *(courtesy U.S. Forest Service)*

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	*Size and Location*	*Points of Interest*
Harpers Ferry National Monument (established 1944)	1,500 acres, at Harpers Ferry; the remainder in Maryland (U.S. 340)	Scene of John Brown's famous raid; site of important fighting during the Civil War
George Washington National Forest (established 1918)	161,236 acres, in the east; the remainder in Virginia (U.S. 11, 33; state 259)	Mountain scenery; caverns; part of forest originally surveyed by George Washington
Monongahela National Forest (established 1920)	1,641,981 acres, in the east (U.S. 33, 219, 220, 250)	Appalachian and Allegheny Mts.; Spruce Knob; Blackwater Canyon; Seneca Indian Trail; rhododendrons in July; limestone caves; observation tower
Blackwater Falls State Park (established 1934)	1,679 acres, near Davis (state 32)	63-ft. waterfall; swimming, riding, and boating in summer; skiing in winter
Droop Mt. Battlefield State Park (established 1929)	269 acres, near Hillsboro (U.S. 219)	Scene of an important Civil War battle; picnicking, playground
Hawk's Nest State Park (established 1935)	94 acres, near Ansted (U.S. 60)	View of New River Gorge (585 ft. deep)
Watoga State Park (established 1934)	10,052 acres, near Huntersville (state 39)	Forest with wild deer and bears; boating and swimming; camping; Brooks Memorial Arboretum; trails

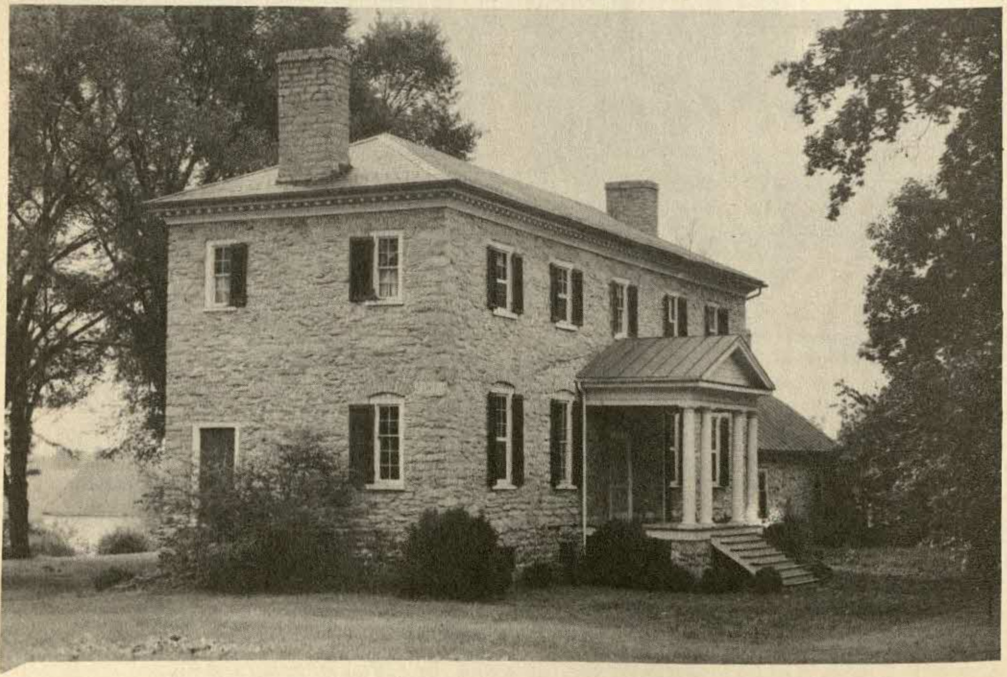
One morning in 1859, a party led by the fanatical abolitionist, John Brown, seized the Federal arsenal at Harpers Ferry with the aim of starting a slave rebellion. Troops commanded by Col. Robert E. Lee captured Brown, and he was sentenced to death, but the South was aroused. In 1861, at an appeal from the President for troops, Virginia voted to secede from the Union. The nonslave-holding western counties held a convention and declared the secession act illegal, and later that year announced themselves united in the new state of West Virginia. In 1863, in the midst of the Civil War, the new state was admitted to the Union (after the war two more counties were added). While most West Virginians fought for the Union during the Civil War, a not inconsiderable number gave their loyalty to the Confederacy.

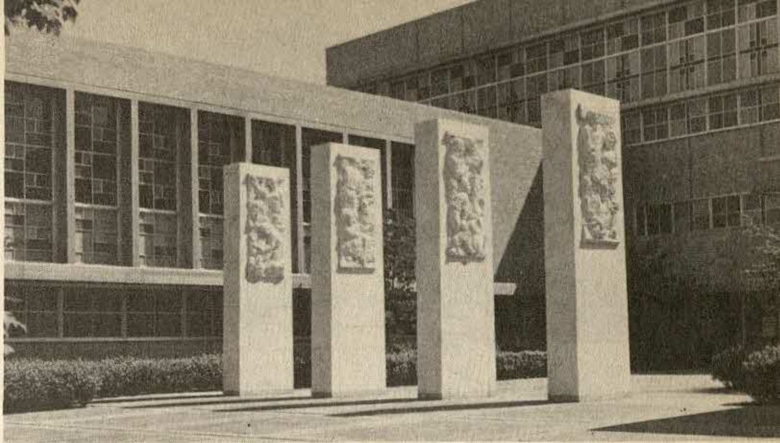
In the years following the Civil War, and especially at the turn of the century, West Virginia turned from farming on a small scale to industry on a large scale. Oil and coal mining developed; steel and chemicals became major industries. During World War I, 58,053 West

HAREWOOD, HOME OF SAMUEL WASHINGTON

The house, at Charles Town, W. Va., was designed by George Washington for his brother, and built about 1770. President James Madison and Dolly Payne Todd were married in its paneled drawing room

Courtesy West Virginia Industrial & Publicity Commn.





UNIVERSITY CAMPUS

This main unit of the $30,000,000 Medical Center of the Univ. of West Virginia is located 2 m. N.W. of the campus at Morgantown (*courtesy West Virginia Industrial and Publicity Commn.*)

Virginians entered the services. In World War II, the government built the nation's first synthetic-rubber factory in West Virginia to replace the supplies of natural rubber cut off by the enemy. The state furnished 233,985 men and women to the armed forces during this war.

In the postwar period, the economy of West Virginia has changed to a marked degree due to the mechanization of the coal mines. The number of miners employed has been reduced from *ca.* 100,000 to *ca.* 40,000, causing a shift in population away from the coal-mining areas. However, the Ohio River and Kanawha River valleys have been highly industrialized with new industries.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

West Virginia, UNIVERSITY OF, a coeducational state land-grant institution of higher learning at Morgantown, W. Va., established in its present form in 1867. It comprises the colleges of arts and sciences, agriculture, commerce, dentistry, education, engineering, forestry, home economics, journalism, law, medicine, mines, music, nursing, pharmacy, and physical education, and a graduate school. It has experimental farms and forests in West Virginia. The institution also includes the Potomac State Coll. of West Virginia Univ. at Keyser. The total number of volumes in all of the university's libraries is 423,000. The annual student enrollment totals *ca.* 8,300, and there are some 500 members of the faculty. The physical plant is valued at *ca.* $52,000,000.

Westward Ho! (*wĕst′wẽrd hō*), a novel by Charles Kingsley (*q.v.*). Published in 1855, it tells of the voyages and romance of an Elizabethan sailor and adventurer.

Wetterhorn (*vĕt′ẽr-hôrn*), one of the high mountains of Switzerland in the Bernese Alps. Renowned for its beauty, it rises above a meadow near the resort town of Grindelwald. The highest of its three peaks, Hasli-Jungfrau, reaches 12,149 ft.

Wettin (*vĕ-tēn′*), the name of a princely house of Saxony from which many royal houses of Europe were descended. The first prominent member of the family was Dietrich, count of Hosgau, who lived in the 10th century. After his death in battle against the Hungarians, his sons received grants of lands taken from the Wends (German slavs), which included the county of Wettin. This county, though the source of the family's name and the site of an ancestral castle, was sold in the 13th century. At the same time, however, the Wettin family was extending its lands to include the margraviate of Meissen (acquired by marriage) and most of Saxony and Thuringia. The division of some of these holdings over the years resulted finally in the duchies of Meiningen; of Saxe-Weimar-Eisenach (which produced the illustrious patron and friend of Goethe, Duke Charles Augustus); and of Saxe-Coburg-Gotha (from which came Leopold I of Belgium, Prince Albert, the consort of Queen Victoria, and Queen Marie of Rumania). The duchies were all dissolved in 1918.

Weyden (*vī′dẹn*), ROGIER VAN DER, Flemish painter, born in Tournai, the Low Countries, *ca.* 1400; died in Brussels in 1464. He served his apprenticeship at Tournai, beginning in 1427, moved to Brussels in 1435, and soon after was appointed town painter there. Except for a year or two spent in Italy *ca.* 1449, he lived and worked all his life in Brussels. Somewhat younger than the Van Eycks and older by 30 years than Hans Memling, he is rated with them among the great exponents of the early Flemish school. Although unmistakably Flemish in his attention to detail—particularly in the delineation of facial character—he had a dramatic approach to his subject, distinguishing his work from that of others in northern Europe during the period of transition from primitive medieval art to the flowering of the Renaissance. Most of his work depicted scenes from Biblical history, including many in the form of an altar piece or of a triptych; he also painted a number of portraits. The Metropolitan Museum of Art, New York City, has six of his works, including two of the most famous, "The Annunciation" and the portrait of Francesco d'Este.

Courtesy National Gallery of Art, Washington, D. C. (Mellon Collection)

PORTRAIT OF A LADY. PAINTING BY ROGIER VAN DER WEYDEN

Others in the Metropolitan are the triptych, "The Descent From the Cross"; the portrait, "Man With a Turban"; and the pictures, "Christ Appearing to His Mother," "The Holy Family," and "Christ and the Virgin." His paintings also are in the Louvre and other national galleries of various European countries.

Weygand (*vâ-gän′*), MAXIME, French general, born at Brussels in 1867. He studied at the French military college at St.-Cyr and at the cavalry school at Saumur. He was made chief of the general staff under Marshal Foch early in World War I, with the rank of general of brigade. In 1917 he represented France on the interallied general staff, but resumed his former position under Foch in April 1918. In the summer of 1920 he attained prominence in Poland during Allied intervention against the Russian revolutionists. He was named a member of the Conseil Supérieur de la Guerre in 1920. He served briefly as the military expert on the French delegation to the Lausanne Conference in 1922, a year later became high commissioner in Syria, and in November 1924 took charge of the Centre des Hautes Études Militaires. In 1931 he was appointed inspector general of the French army and vice president of the Conseil Supérieur.

The German advance into France after the start of World War II led to a reorganization of the French army. Commander-in-chief of the Allied armies in May 1940, he mapped out a "defense in depth," but could not halt the Germans. With Pétain (*q.v.*) as the new premier he was given the post of minister of defense in the cabinet of the Vichy government. Later assigned to check the swing of the French colonies in Africa away from Vichy, he failed and returned to Vichy. He was named French proconsul in Africa and governor general of Algeria (July 1941), but a month later was superseded by Darlan as policy-maker for the colonies. Removed on Nov. 20, 1941, he retired from public life.

American troops entering Germany found him in an internment camp (1945). He was brought before the high court of justice at Paris during the winter of 1945-46 for preliminary investigation of the charge of collaboration. His case was first postponed because of his age and ill health, then deferred indefinitely.

Weygand is the author of "Turenne" (1929), "Marshal Foch" (1929), and "Mangin" (1929).

Weyman (*wī′mạn*), STANLEY JOHN, novelist, born in Ludlow, England, Aug. 7, 1855; died Apr. 10, 1928. After being graduated from Oxford Univ. he became classical instructor at the King's School, Chester. In 1881 he was admitted to the bar and entered the practice of law, but gave considerable attention to literature. His first writings appeared in the *Cornhill Magazine,* in 1883; he later visited various parts of Europe. His chief literary works include "Story of Francis Cludde," "The Man in Black," "My Lady Rotha," "The House of the Wolf," and "Memoirs of a Minister of France." A number of his writings have been translated into French, German, and other languages.

Weymouth (*wā′mŭth*), a town in Norfolk County, Massachusetts, 12 m. S.E. of Boston, on the New York, New Haven & Hartford R.R. The city has 12 m. of waterfront on the Back and Fore Rivers, and is a launching place for large vessels built at Quincy which go to sea via the Weymouth Ship Channel. The important industries include fisheries, wool products, shoes, fertilizer, and agricultural chemicals. Noteworthy buildings include the birthplace of Abigail Adams (*q.v.*), the Samuel Arnold House (1803), the Emery House (a replica on a small scale of Mt. Vernon), and the Fogg Library, which houses a large collection of relics and historic documents associated with the area. Also of interest is King's Cove, where the first Weymouth colonists landed in 1622. The place was first settled as Wessagusset in 1623 and was incorporated as Weymouth in 1635. Population, 1950, 32,690.

Weyprecht (*wī′prĕḳt*), KARL, explorer, born at König, near Michelstadt, Germany, in 1838; died in 1881. He joined the Austrian navy and became an officer in 1861. After several sea voyages, he was for two years assigned to a coastal survey of Dalmatia. In 1871, he organized with Payer an expedition to Spitsbergen and Novaya Zemlya. He was the leader of the Austro-Hungarian expedition (1872-74) which discovered Franz Josef Land, which remained an Austrian possession until further explored and annexed by Russia in 1916. His idea of establishing international polar stations, or co-operative observation posts to benefit the Arctic efforts of all countries concerned, won the approval of several nations, including the U.S. The famous American expedition under Greely (1881-84) was one of those to profit from the plan.

Whale (*hwāl*), a common zoological name for any of the many forms of cetaceans; its popular use, however, refers to the large marine species. The term whale, as used here, includes all members of the order Cetacea regardless of size. As evolution streamlined these animals for an exclusive life in the water, the hind limbs, which served no useful purpose, were lost in distant generations. Immediate ancestors apparently had these limbs, inasmuch as hind limb bones are still to be found buried in the flesh of some living forms. Whales are carnivores and, with the exception of the killer whale which preys on other whales and seals, feed on fish, squid, octopus, and crustaceans.

Whales before diving, technically termed "sounding," fill their lungs with air and normally stay under water from 10 to 20 minutes; a few forms occasionally remain under for 45 minutes and may descend to a depth of 3,000 ft. Rising to the surface, whales come up obliquely, head first, and instantly, on surfacing, the nasal valves are opened and the air in the lungs is released. The breath escaping under pressure through the blowhole produces a low metallic sound which can be heard at a considerable distance on a quiet day. During the time the air is held in the lungs it becomes heated and saturated with moisture which on being discharged and striking the colder air forms a column of condensed vapor called the "spout." Most species of the larger whales have a characteristic spout. All Rorquals spout in a single column; the blue whale has a thick tall spout, 20 ft. high; the humpback spouts in a low rounded cloud; the finback emits a tall thin spout; the right whale's spout divides at the summit and falls on either side; and the sperm whale has a low rounded puff directed forward and upward.

Most whales are sociable and travel in schools. Some follow the coast lines, while others are oceanic and frequent the deep seas. A few live in rivers and lakes.

The cetaceans usually give birth to a single young, occasionally two, which from the first are able to keep pace with the school. Large whales nurse their young for about six months. The life span for blue whales does not exceed 20 years and is only about nine years for the sperm whale. The large whales require about a ton of food each day.

For protection against exposure and cold, whales are covered with a layer of fat which lies just under the skin and is rich in oil. The blubber varies in thickness from about 1 in. in porpoises to as much as 20 in. on some parts of certain whales. During the early 19th century whale oil was used for all purposes that called for oil: soap, lighting, and lubrication, and towns were sometimes illuminated by gas made from whale oil.

The whaling industry dates back many thousands of years. It was flourishing in the 12th century when whales were hunted in small boats and killed by hand-thrown harpoons, a method that lasted well into the 19th century. Now, factory ships are used to cut up and process the whale. The modern harpoon is fired from a cannon at the bow of a "catcher," a small fast boat. The present-day harpoon not only has barbs which open as it enters the flesh, but also contains a bomb that kills or fatally wounds the whale.

Ambergris is a product of the whale. It is a grayish spongy substance secreted in the intestines, thought to be caused by the irritation produced by the beaks of squid in the alimentary canal of a whale. Ambergris is valuable as a base for perfumes—not for the slight smell in itself but for its fixative powers.

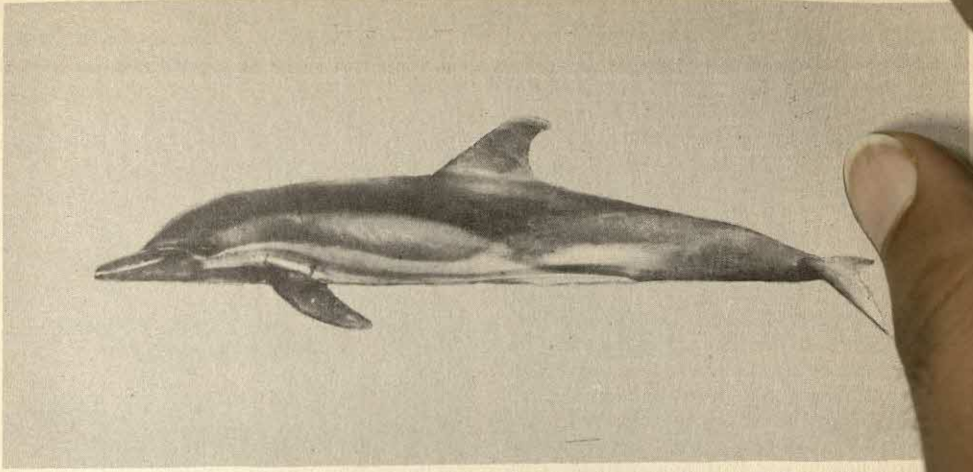
Whales are separable into two major groups, toothed whales and whalebone whales. The toothed whales have teeth in the lower jaw or in both jaws. All porpoises and dolphins, though of relatively small size, belong in the same suborder as the toothed whales. The larger species, such as the sperm and killer whales, could easily swallow a large seal. Baleen whales have whalebones in place of teeth. The throat in these whales is only a few inches in diameter.

There are seven genera of whalebone whales in the suborder Mysticeti. The GRAY WHALE (*Rhachianectes glaucus*) is restricted to the western shores of North America. It has two or four throat furrows, no distinct dorsal fin, and a maximum length of 50 ft. The COMMON FINBACK (*Balaenoptera physalus*), found in all oceans, may be distinguished by its long slender form and its falcate dorsal fin, which is placed well back on its body. The throat is marked by numerous longitudinal ridges or folds. It attains a maximum length of 82 ft. The SEI WHALE (*Balaenoptera borealis*) is smaller than the finback whale, and rarely exceeds 50 ft. in length; the dorsal fin is placed well forward, and there are furrows on throat. Its range extends from Iceland and the

Bering Sea south to the Antarctic. The Little Piked whale (*Balaenoptera*) is so named for its tall dorsal fin and may be recognized by its small size and the white band across the upper side of the flippers. It is the smallest of the whales with ridges on the throat. Length of adults is not more than 30 ft. *Balaenoptera acutorostrata* is the name used for the North Atlantic form, *B. davidsoni* for the North Pacific one, and *B. huttoni* for the Antarctic form. The Humpback whale (*Megaptera novaeangliae*) is cosmopolitan in distribution, and winters in the tropical seas but migrates to the polar region in summer. It is a robust whale with long narrow flippers; the flukes are scalloped on the posterior border and the throat ridges are broad. The length of an adult is 50 ft. The Blue whale (*Sibbaldus musculus*) is the largest animal that ever lived, resembling the finback whale in general appearance, measuring up to 100 ft. or more in length. In summer this whale haunts the polar ice packs of both hemispheres and feeds on minute crustaceans known as "kril." New-born young are about 20 ft. long and double their size in their first year. The average speed of a blue whale is about 10 or 12 knots, but it can speed up to more than 14 knots. The Bowhead whale (*Balaena mysticetus*) is a smooth-throated species measuring from 50 to 65 ft. in length; it has no dorsal fin, and the enormous head is more than one-third the total length. Its range is restricted to the seas around the Bering Strait. The Right whale (*Eubalaena*) is so named because it was the "right" whale to find, having a slow speed, great buoyancy of body, and much oil and whalebone. There are three recognized species of right whales: *Eubalaena glacialis,* found in the North Atlantic Ocean, *E. australis* in southern oceans, and *E. siboldii* in the North Pacific Ocean. The right whale has a short, chunky form and no dorsal fin or throat furrows. It reaches a length of about 50 ft. The Pygmy Right whale (*Neobalaena marginata*) lives in Australian and New Zealand waters and reaches a length of 20 ft. It is smooth throated and is peculiar in that it has 17 pairs of flattened ribs.

The suborder, Odontoceti, includes porpoises, dolphins, and toothed whales. The Ganges River dolphin (*Platanista gangetica*) has a long compressed beak and formidable rows of teeth. Being almost blind, it prods with its long beak for fish buried in the mud at the bottom of the rivers in Northern India and never goes to sea. The Amazon River dolphin (*Inia geofroyyensis*) is restricted to the fresh waters of the Amazon and Orinoco in South America and has a slender and nearly cylindrical beak. (The White Flag dolphin (*Lipotes vexillifer*) is restricted to the freshwater Tung Ting Lake in Hunan Province, China. Its beak is fully a foot in length and curves slightly upward. The La Plata dolphin (*Stenodelphis blainvillii*) favors the estuaries of freshwater rivers and is found along the Atlantic coast of South America. It is a highly specialized form with long slender teeth. True's Beaked whale (*Mesoplodon mirus*) includes several species in the genus *Mesoplodon.* They occur in the temperate and tropical oceans of the world and rarely exceed 20 ft. in length. All have two grooves on the throat that converge anteriorly, a single pair of teeth near the extremity of the lower jaw, and the muzzle produced in a long beak. Allied species include Sowerby's whale (*Mesoplodon bidens*), Gervais's whale (*M. europaeus*), Blainville's whale (*M. densirostris*), and Stejneger's whale (*M. stejnegeri*). Cuvier's Beaked whale (*Ziphius cavirostris*) is similar to *Mesoplodon* and *Berardius* but has a shorter beak. A single pair of teeth at the extremity of the lower jaw protrude horizontally forward. Mature specimens reach a length of 28 ft. It is cosmopolitan and has a wide individual range. Shepherd's Beaked whale (*Tasmacetus shepherdi*) has about 90 functional teeth in both jaws and two bulbous terminal teeth in the mandible. It is restricted to the South Pacific. Baird's whale (*Berardius bairdii*) is a close kin of *Mesoplodon* and measures up to 40 ft. in length. It is found in the North Pacific from Bering Strait south to California. The Bottlenosed whale (*Hyperoodon ampullatus*) may be recognized by the prominent frontal region of the head which rises almost abruptly behind the nares, especially in males. Adult males average between 25 and 30 ft. Its summer range is the Arctic Seas and North Atlantic, and in the winter it moves as far south as the Mediterranean sea.

The Sperm whale, or Cachalot (*Physeter catodon*), largest of the toothed whales, is found in all oceans. It is easily recognized by its enormous truncated head. The muzzle does not correspond in form with the skull but holds a tank or reservoir overlying the rostrum that contains the valuable spermaceti oil. The long narrow mandible is armed with 20 or 30 heavy conical teeth. The sperm whale reaches a length of about 65 ft. and requires a ton of food a day. Its average speed of travel is about four knots. The Pygmy Sperm whale (*Kogi breviceps*) does not exceed 13 ft. in length. Its habitat is the temperate and tropical coastal waters of most seas. Its bluntly pointed snout which overhangs the lower jaw resembles that of the sperm whale, but the teeth in the lower jaw are long and slender. The White whale (*Dalphinqpterus leucas*) is found in the Arctic and sub-Arctic seas and favors shallow coastal waters, bays, and large rivers. The adult is entirely white. The Narwhal (*Monodon monoceros*) is a native of the Arctic seas. Its long



Courtesy American Museum of Natural History.

COMMON DOLPHIN

clockwise spirally twisted tusk, occasionally exceeding 7 ft. in length, projects from the left side of the upper jaw and is a peculiarity shared by no other animal. Usually only the male has this tusk, and as far as is known it is never used by the animal as a weapon.

The Rough-toothed dolphin (*Steno rostratus*) frequents the coastal waters of the warm seas and may be recognized by its slender beak which is compressed on either side and not flattened like those of other dolphins. The teeth have a peculiar roughened surface due to fine vertical ridges. The Guiana River dolphin (*Sotalia guianensis*) inhabits the coastal waters as well as the rivers of the Guianas. Close relatives are found in the tropical waters of South America, Africa, India, and the China Sea. The Long-snouted dolphin (*Stenella plagiodon*) appears to be almost black in color from afar, but is mottled with numerous white spots. This species is common along the coasts on both sides of the North Atlantic Ocean. Several kinds are recognized. *Stenella graffmani* is the Pacific Ocean representative of the genus. The Common dolphin (*Delphinus delphis*) frequents the high seas and reaches a length of 8 ft. It has a long tapering beak and characteristic black ring around the eye. The black of the back is followed by varied colors in broad stripes and bands along the sides. Risso's dolphin (*Grampidelphis griseus*) is recognized by its rounded head, high forehead, high falcate dorsal fin, and by the absence of teeth in the upper jaw. It is a widely distributed species and occurs in most seas. It is frequently called "grampus" owing to a confusion of names in the 19th century. The Bottlenosed dolphin (*Tursiops truncatus*) is common along the Atlantic seaboard of the U.S. It bears no resemblance to the bottlenosed whale. It is lead gray in color, with a beak scarcely 3 in. long and a tall dorsal fin. Closely allied species occur in the Pacific, the Australian seas, the In Ocean, and in most temperate and warm s The White-beaked dolphin (*Lagenorhynchus a birostris*) is common in the North Atlantic and may be recognized by its white beak, and high dorsal fin. Schools of over 1,000 are not unusual. The White-sided dolphin (*Lagenorhynchus acutus*) is a closely allied form, frequenting the North Atlantic, and may be distinguished by the extensive light area on each side of the body and the conspicuous yellowish lateral stripes. The beak of this species is black. The North Pacific Striped dolphin (*Lagenorhynchus obliquidens*) is also a close relative. Commerson's dolphin (*Cephalorhynchus commersonii*) was originally discovered off the coast of Tierra del Fuego and is frequently seen by boats passing through the Strait of Magellan. Its range extends in the South Atlantic Ocean from the latitude of Bahia Blanca, Argentina, to Cape Horn. Several other close relatives with a different color pattern occur in the southern seas. Its striking color pattern is distinctive: the space from behind the head back to the dorsal fin, and sometimes beyond, is pure white, while the rest of the animal except the white throat is black.

The Killer whale (*Grampus orca*) is found in all oceans from the Arctic to the Antarctic and is readily recognized by its characteristic tall black dorsal fin that rises in the air when the animal swims at the surface. Males reach a length of 30 ft. Killer whales hunt in packs and habitually prey on other warm-blooded marine creatures. They do not hesitate to attack and kill seals, porpoises, and the larger whales. The False Killer (*Pseudorca crassidens*) is a wide-ranging cetacean that travels in large schools and, probably with the exception of the polar regions, makes sporadic appearances in all oceans. It may be recognized by its flattened head, blunt snout, low rounded dorsal fin, and the absence of a beak.

The BLACKFISH or PILOT WHALE (*Globicephala ventricosa*). The name Blackfish alludes to its black color and Pilot whale applies to its peculiar habit of following a leader even though it leads to certain death. It is a common species and occurs in schools numbering up to several hundreds that migrate with the seasons from Greenland to the Faroe Islands, from Norway to the Cape of Good Hope, and in the Pacific from Japan to New Zealand. Three species have been recognized: *Globicephala ventricosa* is the Atlantic form, *G. scammoni* occurs in the Pacific, and *G. brachypterus* is a southern form.

The IRRAWADDY RIVER PORPOISE (*Orcella brevirostris*) is a beakless porpoise inhabiting the warmer Asiatic coastal seas. It travels in schools far up the rivers and has a peculiar habit of squirting water from its mouth. The RIGHT WHALE DOLPHIN (*Lissodelphis borealis*) is so named because of the absence of a dorsal fin—a character shared with the larger Right whales. It is a slender species that frequents the deep waters of the North Pacific. The jet black of the body is broken only by a snow-white waistcoat and narrow ventral line. PERON'S DOLPHIN (*L. peroni*) is a related species found in the South Pacific. The HARBOR PORPOISE (*Phocaena phocaena*) is about 5 ft. long, has a rounded head, and is readily distinguished by the flat, spadelike formation of its teeth. It travels in schools along the coasts of the Atlantic Ocean. A closely allied species, *P. vomerina,* occurs in the Pacific. Several other forms have been described from the southern seas. DALL'S PORPOISE (*Phocaenoides dalli*) is the black and white porpoise frequently seen in the waters along the inland passage near Kodiak Island and the Aleutian Islands. Its range extends south along the coast of Mexico. A second species of this genus, *P. truei,* occurs in the waters around Japan. The BLACK FINLESS PORPOISE (*Neomeris* [*Neophocaena*] *phocoenoides*) is a native to the warm region of the Asiatic coastal waters and ascends fresh-water rivers. The black color, rounded head, and absence of a dorsal fin serve to distinguish it from other local species. See also *Spermaceti.*

Whalebone (*hwăl'bōn*), an epidermal outgrowth in the mouth of certain species of whales, consists of a series of thin flattened horny plates. Each plate is somewhat triangular and is placed transversely on each side of the mouth, with the base attached to the palate and the apex hanging downward. The inner edge and tip are frayed into long, bristly fibers forming a fine sieve which reaches from the top to the bottom of the mouth. It serves to strain out the water from the "soup" of small animals or fish that are scooped up by the feeding whale. When feeding, the whalebone whale swims with its huge mouth open, engulfing masses of small shrimplike crustaceans that live near the surface of the water. On closing its mouth and raising its tongue, the water is forced through a hairy sieve of whalebone and escapes through the lips leaving the small animal life to be swallowed. Whalebone was in great demand when bustles, basques, and hoopskirts were in vogue—strips of whalebone were used for reinforcement. Before the era of cheap spring steel, whalebone was also used for "stays" or corsets. This industry reached its peak about 1900 when the price of whalebone reached seven dollars a pound.

Whangho (*whăng'hō'*). See *Hoang-ho.*

Wharf (*hwa̤rf*), a structure of earth, wood, concrete, steel, or stone, along or projecting from the bank, shore, or margin of navigable waters, constructed so as to provide a suitable platform for the loading and unloading of vessels. It may be either a solid, solid-filled, or open-type structure. Wharves built parallel to the shore are generally known as *quays,* while those built at right angles or obliquely to shore are generally called *piers.*

The limit of the projection from the shore line for solid or solid-filled structures is known as the bulkhead line and the limit for the open types is known as the pierhead line. These limits in navigable waters of the U.S. are fixed by the Secretary of War.

Wharves maintained on the margin of waters where the tide or currents have a material effect are usually in the form of quays; elsewhere they are generally constructed as piers. In narrow waters it may be necessary to construct piers obliquely with the shore to facilitate the entrance of vessels into slips. In open types the superstructure generally consists of a wood or concrete deck supported on piles or cribs. The latter construction is generally used where the bottom of the stream or river is too hard for pile penetration.

In most countries the wharves are controlled by the national government and owners of ships are charged a nominal rental when their vessels make use of them. However, in the U.S. the privileges are controlled by the several states, which lease them to individuals or corporations.

Wharton (*hwôr'tŭn*), EDITH JONES, novelist, born in New York City, in 1862; died Aug. 11, 1937. She was educated by private tutors in her home and in 1885 married George Wharton, of Boston. Her writings have been widely read, both in America and Europe. She translated from the German Sudermann's "The Life That Is Lived." Her leading works include: "The Greater Inclination," "Italian Villas and Their Gardens," "The Touchstone," "The Valley of Decision," "The House of Mirth," "Age of Innocence" (Pulitzer Prize, 1921), "Ethan Frome," "The Old Maid," "Certain People," and her autobiography, "A

Courtesy D. Appleton-Century Co., N. Y.

EDITH WHARTON

Backward Glance." Most of her works reflect the stilted society of New York at the turn of the century.

Wharton, FRANCIS, jurist, born in Philadelphia, Pa., Mar. 7, 1820; died Feb. 21, 1889. He was graduated from Yale Univ. in 1839, studied law, and began a successful practice in Philadelphia. In 1845 he became assistant attorney general and in 1856 was made professor of logic and rhetoric at Kenyon Coll., Ohio. He made a tour of Europe, was ordained to the pastorate of the Episcopal Church, and for some time served as rector in Brookline, Mass. In 1885 he was appointed by President Cleveland as counsel of the State Department in Washington, D.C., and subsequently became editor of the Revolutionary diplomatic correspondence of the Federal government. His books include "A Treaty on Theism and Modern Skeptical Theories" and "A Treatise on the Criminal Law of the U.S."

Whately (*hwāt′lĭ*), RICHARD, clergyman and author, born in London, England, Feb. 1, 1787; died in Dublin, Oct. 8, 1863. His father was a clergyman at Bristol, where he attended a private school, and afterward was graduated from Oxford Univ. In 1811 he was elected fellow at Oriel Coll., but three years later became a clergyman. He did vigorous work in a parish for two years, and in 1825 was made principal of St. Albans Hall. He later became a lecturer on economics. In 1831 he was appointed Archbishop of Dublin, in which capacity he did much for the mission and school work in Ireland and rendered large charities to the people, especially during the famine. He wrote extensively on religious, historical, and philosophical topics.

Wheat (*hwēt*), an important and widely cultivated cereal. It is excelled only by rice as regards the number of people using it as a staple food. The plant that produces this grain is a tall, slender, annual or biennial member of the grass family, having a hollow, jointed stem and bearing at the top a somewhat four-cornered spike of usually four-flowered spikelets, called the *ear,* or *head.* Though not known in a wild state, it is thought to have come from Asia. It has been cultivated so long before the dawn of written history that its origin is shrouded in mythology. Among the Romans wheat was considered to be the gift of Ceres, and this idea is perpetuated today in the common word *cereal.* The Spaniards brought wheat culture to Mexico in 1530.

Although wheat flourishes in regions considerably different from each other and is cultivated in many parts of the earth, it thrives best in a temperate climate and in rich clay and loam soils. The chief species include bearded wheat, unbearded wheat, and spelt or German wheat. *Bearded wheat* has a kind of awn or slender spine extending from the ears, while *unbearded wheat* is awnless. *Spelt* is less valuable than other species, but it possesses the advantage of growing in poorer soils and at greater elevations. Wheat is distinguished also as spring and winter, or fall, wheat. *Spring wheat* is sown in the spring and harvested in July or August, while *winter wheat* is sown in autumn and is harvested the following summer. While both kinds are of high value, winter wheat usually commands a slightly higher price in the market, owing to its yielding a larger percentage of flour. Two other classes of wheat are *red wheat* and *white wheat,* these names referring to the color of the grain. The white wheat is less hardy than the red, but it yields better and is of a finer quality.

Few plants have a higher value than wheat. As a food product it possesses much value for the starch and gluten contained in it. It also has mineral properties necessary to health.

The grains are removed from the husks by a threshing machine and are afterward ground into flour. The outer layer of the grain is removed in milling to produce white flour, but when the whole grains are ground whole wheat flour is produced. Besides the use of wheat flour in making bread, it is employed extensively in the production of starch, crackers, cakes, breakfast cereals, spaghetti, and macaroni. The bran, shorts, and husks are of value as food for animals, and the straw is employed for animal food and in the manufacture of various articles, such as straw hats, mats, and crude paper. At present the U.S. is the greatest wheat-producing country in the world, the annual production being around 1,075,000,000 bushels. Kansas and North Dakota have long ranked as the leading wheat-producing states. As a whole, the most productive wheat-growing region is in the northwestern states. The states ranking next to Kansas and North Dakota in growing

National Film Board Photo

WHEAT

Blowing the chaff from a handful of grain, a farmer takes a rough test to determine yield

wheat include Oklahoma, South Dakota, Nebraska, Ohio, Indiana, Illinois, Texas, Minnesota, Oregon, Washington, and Pennsylvania. Canada produces huge quantities of wheat, the largest crops being grown in Manitoba, Ontario, Saskatchewan, and Alberta. Russia, France, India, Australia, Argentina, Germany, Spain, and Italy are other leading wheat-producing countries. Chicago, Minneapolis, Duluth, Buffalo, Winnipeg and Vancouver are among the leading wheat markets of North America.

Wheat Midge (*hwēt mĭj*), an insect which is harmful to wheat, related more or less closely to the Hessian fly. It is native to Europe, but was brought to the Province of Quebec, Canada, at an early date, whence it has spread to the region extending through the central part of North America. The adult is of an orange or yellow color, and does not make its appearance until early summer. It is about 1/10 in. long and lays small eggs in the heads of wheat as the grain stands in the field; when the larvae appear they extract the milky juice and cause the heads to blight. The larvae, after attaining full growth, descend to the ground and hibernate in small cocoons. Deep plowing will destroy large numbers of them.

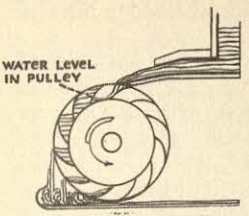
Wheaton (*hwē′tŭn*), HENRY, jurist and diplomat, born in Providence, R.I., Nov. 27, 1785; died Mar. 11, 1848. He studied at Brown Univ., was graduated in 1802, and three years later was admitted to the bar. Subsequently he studied in Europe, but returned to the U.S. in 1807 to begin the practice of law at Providence. In 1812 he moved to New York and for some time edited the *National Advocate*, which became an influential organ in politics. He was made reporter of the U.S. Supreme Court in 1816, serving until 1827, and for some time was *chargé d'affaires* in Denmark. From 1837-46, he was minister plenipotentiary at the court of Prussia. His "Elements of International Law," which has been translated into several languages, was a famous standard work in its field for many decades.

Wheaton, LOYD, soldier, born at Fairfield, Mich., July 15, 1838; died Sept. 17, 1918. He joined the Federal Army as first sergeant at the beginning of the Civil War, became captain in 1862, major in 1863, and lieutenant colonel in the volunteer service in 1864. In 1866 he was made captain in the regular army and in 1891 became major. He aided in suppressing a Fenian raid from U.S. territory upon Manitoba in 1871, and in 1874 took part in Custer's expedition to the Black Hills. During the Spanish-American War he was a brigadier general and commanded a division of the Seventh Army Corps in Cuba. In 1899 he was sent to the Philippines to aid in suppressing the insurrection in Luzon. He was retired from the service in 1902.

Wheatstone (*hwēt′stŭn*), SIR CHARLES, electrician and inventor, born in Gloucester, England, in 1802; died in Paris, France, Oct. 19, 1875. He was the son of a music seller and became a musical instrument maker. Besides making a number of discoveries in acoustics, he extended his investigations to light and electricity, and in 1834 became a professor at King's Coll., London. While experimenting there on the velocity of electricity, he devised improvements in the then existing system of transmitting messages by telegraphy. In 1837 he obtained a patent "for improvements in giving signals . . . in distant places by means of electric currents transmitted through metallic circuits" but his system was not adapted to practical use until after Morse patented his telegraphic instruments. Wheatstone also invented the stereoscope and was the first to experiment with submarine transmission of telegraphic messages. In 1837 he became a fellow of the Royal Society and in 1868 was knighted by Queen Victoria. His many papers, which include "New Experiments in Sound," "On Acoustic Figures," and "Experiments to Measure the Velocity of Electricity," were collected after his death and published in 1879 under the title, "Scientific Papers of Sir Charles Wheatstone."

He developed the Wheatstone bridge, a device for accurate measurement of electrical resistance.

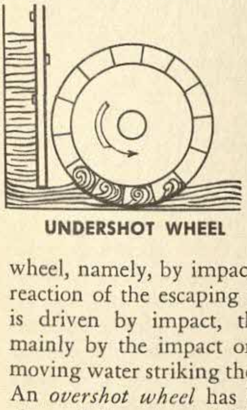
Wheel (*hwēl*), a circular frame or solid disk employed to reduce friction and facilitate movement, as in vehicles; to produce rotary motion, as in machines; or to modify speed, as in the form of pulleys. Many kinds of wheels are employed in the arts and industries, their form and structure depending on their uses. The only feature which is universally characteristic of wheels is rotation, which may be either partial or entire. The center of a wheel is called its hub, or nave; the spokes are the bars leading to the outer edge which is called the rim, or felly.



OVERSHOT WHEEL

The wheels used in machinery are known as *cam, cog, belt, spur, crown, fly, ratchet, pinion,* or *balance* wheels. Sets of wheels in machinery are joined by belts or bands, or transmit motion by means of teeth or cogs.

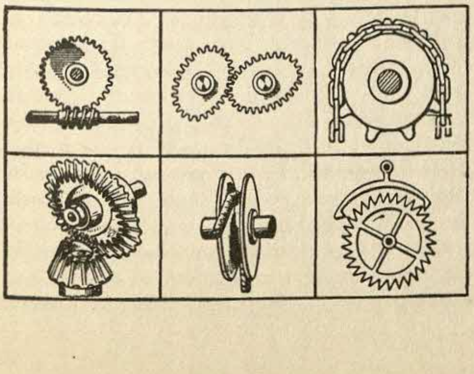
The development of the power of water through *water wheels* is about five centuries old. No exact date can be given for the first device of this kind, the earliest authentic record being a description of the water wheels at Lyons, France, dated in 1555. There are three ways in which the energy or motion of a running stream can be transferred to a water wheel, namely, by impact, by weight, and by the reaction of the escaping jet. An *undershot wheel* is driven by impact, the wheel being moved mainly by the impact or blow produced by the moving water striking the flat boards of the wheel. An *overshot wheel* has buckets or boxes on the rim and the water, which flows into the buckets from above, turns the wheel by its momentum and by the weight of the water in the buckets, the side of the wheel that receives the water being heavier than the opposite side. The reaction of the escaping jet is utilized in the *turbine water wheel,* which is driven partly by the momentum of the moving water and partly by the weight of the water in the buckets. Many forms of turbines are in use; the axis of rotation may be either vertical or horizontal. The size of all classes of water wheels varies with the water supply and the power which is desired. See also *Rotor; Turbine.*



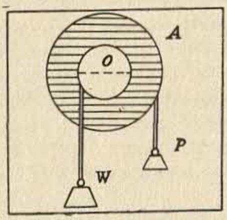
UNDERSHOT WHEEL

WHEELS

Screw Gears
Bevel Gears
Elliptical Gears
Sheave
Sprocket Wheel
Escapement



Wheel and Axle (*hwēl and ăḳs'l*), a machine in the form of a continuous lever in which force is applied at the circumference of a wheel to raise a weight attached to a rope wound around the axle. It is classed by physicists as one of the simplest or elemental machines. A windlass is a form of wheel and axle. When the crank of a windlass is turned, the rope is wound around the axle, which causes the weight at the lower end of the rope to be raised. The wheel and axle is a modification of the lever; the fulcrum is at the axis, the arm of the force is the radius of the wheel, and the arm of the weight is the radius of the axle. One complete turn of the wheel causes the weight to be raised only the length of the rope wound once around the axle, hence a force of one pound's weight applied at the wheel rim will raise a weight, applied at the axle, as many pounds heavier as the circumference of the wheel rim is times the circumference of the axle. When a winch is substituted for the wheel, the circumference described by the force in one revolution is substituted for the circumference of the wheel. The capstan is an example of this machine. It is used extensively in moving houses and bodies of large bulk, while the windlass is used for raising anchors and for raising water from a well.



WHEEL AND AXLE

A Circumference of Wheel; *O* Circumference of Axle; *P* Force; *W* Weight; *B* Radius of Axle

Wheel Lock (*hwēl lŏḳ*). See *Rifle.*

Wheeler (*hwēl'ẽr*), BURTON KENDALL, U.S. Senator, born at Hudson, Mass., Feb. 27, 1882. He studied at the Univ. of Michigan, was admitted to the Montana bar in 1906, and practiced law successfully at Butte. In 1911 he was elected a member of the Montana legislature, serving two years, and then became U.S. district attorney in Montana under President Wilson. In 1922 he was elected on the Democratic ticket to the U.S. Senate, where he was prominent in the investigations of the Teapot oil leases. He declared himself in favor of the party of Robert La Follette (*q.v.*) in

1924, and was nominated for Vice President on the Progressive ticket, but returned to the Democratic party to support Alfred E. Smith for President in 1928.

He supported most of the New Deal program, but held a strongly isolationist viewpoint before the Japanese attack on Pearl Harbor and America's entrance into World War II. Unlike most of the other Congressmen sharing that position, he did not modify it to any large extent during or after the war, and he was one of seven senators to vote against U.S. participation in the United Nations organization. He was defeated in the Democratic primaries in July 1946. In 1947 he was hired by the Senate War Investigating Committee to check the history of American-British deals for Middle East oil.

Wheeler, JOSEPH, soldier and statesman, born in Augusta, Ga., Sept. 10, 1836; died in Brooklyn, N.Y., Jan. 25, 1906. He was graduated (1859) from the U.S. Military Acad. at West Point and served two years in the regular army. He resigned from the Union service in 1861 to join the Confederate army. Commissioned a first lieutenant, he rose to the rank of lieutenant general. From 1862 until the close of the Civil War, he was in command of cavalry in the western zone of fighting. Nicknamed "Fighting Joe," he played a brilliant role at Shiloh and in the campaigns in Tennessee and Georgia. He is said to have taken part in 200 engagements and 800 skirmishes.

A Democrat, Wheeler was elected a U.S. Representative in 1880 and was re-elected three times. In 1898 he was made major general of volunteers in command of dismounted cavalry in the Santiago campaign of the Spanish-American War. Subsequently he served as a brigadier general in the Philippine Islands.

Wheeler, WILLIAM ALMON, politician, born in Malone, N.Y., June 30, 1819; died there June 14, 1887. After being admitted to the bar, he entered upon a successful law practice and was U.S. district attorney in New York from 1845-49. He was Vice President under President Hayes.

Wheeling (*hwē'lĭng*), a city in West Virginia, seat of Ohio County, on the Ohio River, *ca.* 65 m. S.E. of Pittsburgh, Pa. It is served by the Pennsylvania, Baltimore & Ohio, and Nickel Plate R.R.'s. The municipal airport is 11 m. N.E. of the city.

With an area of 10.4 sq. m., Wheeling is located in the Panhandle section of the state, in the Ohio Valley. Its chief parks are Oglebay Park (1,500 acres) and Wheeling Park (170 acres). Wheeling Island, in the Ohio River, is a residential suburb and the site of Wheeling Downs, a half-mile horse-racing track. Among points of interest are the site of Ft. Henry (built in 1774 and named for Patrick Henry), where the last battle of the Revolutionary War took place (1782); and the Wheeling Suspension Bridge, the longest of its type in the world at the time of its dedication (1849), which was made a National Monument in 1956.

Long known as the "Nail City," Wheeling is an industrial community in a rich gas and bituminous-coal region. Its principal manufactures are steel, chemicals, glass and chinaware, tile, pharmaceuticals, textiles, and plastics. The city forms part of the Wheeling-Steubenville (Ohio) standard metropolitan area (1,530 sq. m.; pop., 1950, 354,092), which in 1954 had a value added by manufacture of $404,133,000; the figure for the city alone was $49,668,000.

Wheeling's schools are included in a county unit system. Institutions of higher learning include Wheeling Coll. (Roman Catholic), Linsly Military Inst., and Mt. de Chantal Acad. The city has a council-manager form of government.

Wheeling was founded in 1769 by Col. Ebenezer Zane and was first called Zanesburg. The town was laid out in 1793. It was incorporated in 1806 and chartered as a city in 1836. The name is derived from an Indian word, "weeling," or "place of the head." During the Civil War, when Virginia seceded from the Union, Wheeling was the site of the conferences that set up the "Restored Government of Virginia." It was capital of West Virginia (*q.v.*) from 1863 to 1870 and from 1875 to 1885. Population, 1940, 61,099; in 1950, 58,891; in 1959 (est.), 65,000.

Wheelock (*hwē'lŏk*), ELEAZAR, clergyman and educator, born in Windham, Conn., April 22, 1711; died in Hanover, N.H., April 24, 1779. Graduated from Yale (1733) and licensed to preach (1734), he served as pastor in Lebanon, Conn., from 1735 to 1770. Given a house and two acres of land by Col. Joshua Moor, he opened (1754) a mission school called Moor's Indian Charity School. In 1770 he moved the school to Dresden (now Hanover), N.H., where he founded Dartmouth Coll. for white and Indian students. Wheelock was its president until his death.

His son, JOHN WHEELOCK (1754-1817), succeeded him as president of the college in 1779. A member of the first graduating class (1771), he fought in the Revolutionary War. During his first 25 years as president of Dartmouth he brought about great expansion; disagreement with the Board of Trustees, however, beginning about 1804, culminated in his removal in 1815.

Whetstone (*hwĕt'stōn*), a stone used for sharpening utensils by the application of friction. The better grades of whetstones are generally fine sandstones or fine-grained, highly siliceous argillite or mica schist in which innumerable minute crystals of some hard mineral, such as garnet or magnetite, are often embedded.

Whig (*hwĭg*), the name applied in England to the opponents of James II, and therefore acquiring a connotation of opposition to Catholicism and to the "divine right" of kings. Afterward the name was assumed in North America by the supporters of the cause of colonies against the king of England in the Revolution. The Whigs disappeared from politics after the Revolution had been successfully accomplished, and the people became divided into Federalists and Democrats. A division of sentiment came about in the administration of Andrew Jackson, when numerous small parties began to form, and in 1834 James Watson Webb led the opposition against the party of Jackson in forming the new Whig party, the name being assumed because the new party, like the Whigs of the American Revolution, declared itself against executive usurpations. It favored everything opposed by Jackson, namely, a national bank, a high protective tariff, the passage of bills over the veto by a majority vote, limitation of the power of removal from office, and extensive internal improvements.

William H. Harrison was the Whig candidate for President in 1836, but was defeated by Van Buren. Renominated in 1840, he defeated Van Buren, receiving 234 electoral votes, while the latter received 60. The party had a good working majority in each house of Congress, but Harrison died shortly after being installed in office, when Tyler became President. The latter showed strong democratic tendencies by vetoing two bank bills and two tariff bills and distributing the proceeds of land sales to the states. He was accordingly declared to be out of the party and Henry Clay became the candidate for President in 1844, but was defeated by James K. Polk. In 1848 Zachary Taylor, the hero of the Mexican War, was nominated and elected President, but he died in office and was succeeded by his Vice President, Millard Fillmore. The party became weakened by accepting the Compromise of 1850, which divided it into *Conscience Whigs* and *Cotton Whigs,* and in the election of 1852 its candidate, Winfield Scott, met with defeat. Many Whigs soon joined the American party in the North, while the Southern Whigs generally united with the Democrats. A number of other parties, such as the Free Soilers, Constitutional Unionists, and Abolitionists, were strengthened, and from these elements the present Republican party was formed. See *United States:* HISTORY; *Political Parties in the United States.*

Whip (*hwĭp*), in politics, a person, who as a member of a legislature, is appointed to enforce party discipline and to insure the attendance of all party members at important sessions. Each political party has its own whip, all of them serving to keep their leaders informed of party sentiment, as well as acting as vote recorders. If a member is unable to attend a meeting at which a vote will be taken, the whip attempts to pair his vote with an opposition member who will also be absent.

ABRAHAM WHIPPLE

Whipple (*hwĭp'p'l*), ABRAHAM, naval officer, born in Providence, R.I., Sept. 16, 1733; died in Marietta, O., May 29, 1819. He entered the navy at an early age and from 1759-60 commanded the privateer *Gamecock* in the French and Indian War. In 1772 he headed the expedition which burned the *Gaspé* in Narragansett Bay, and at the beginning of the Revolutionary War was placed in command of two Rhode Island vessels. He commanded the *Providence* in 1776, which captured more British vessels than any other American ship. In 1780 he was taken prisoner near Charleston, but was released and in 1784 visited London. After resigning from the naval service, he joined the Ohio Co. and settled at Marietta.

Whipple (*hwĭp''l*), GEORGE HOYT, pathologist, born in Ashland, N.H., Aug. 28, 1878. Educated at Yale and Johns Hopkins universities, he was a resident pathologist at several hospitals and later taught pathology at Johns Hopkins and at the universities of California and Rochester, where he also held deanships. In 1934 he shared the Nobel Prize for physiology and medicine with George R. Minot and William P. Murphy (*qq.v.*) for discovery of liver therapy in anemia.

Whipple, GUY MONTROSE, psychologist, born in Danvers, Mass., June 12, 1876; died in Clifton, Mass., Aug. 1, 1941. After receiving his Ph.D. in psychology from Cornell Univ. in 1900, he taught psychology and education at several universities and edited a number of publications and books in these fields. He also wrote several books relating to educational psychology and testing.

Whipple, HENRY BENJAMIN, clergyman, born in Adams, N.Y., Feb. 15, 1822; died in Faribault, Minn., Sept. 16, 1901. After a short time in business and private theological courses, he was drawn to the Protestant Episcopal Church and became a priest. He was interested in the social and educational work of the church and served in a Chicago parish (1857-59). In 1859 he was consecrated bishop of Minnesota, where he was active in efforts to reform the government's Indian policy, which he considered unjust and inhumane. His criticism of Indian policy appears in his book "Lights and Shadows of a Long Episcopate" (1899).

Whipple, WILLIAM, politician and soldier, born in Kittery, Maine, Jan. 14, 1730; died in Portsmouth, N.H., Nov. 10, 1785. He was a member of the Provincial Congress of New Hampshire in 1775 and served in the Continental Congress (1776-79). He was an American patriot and was a signer of the Declaration of Independence. During the Revolution he served as brigadier general, believing independence could be achieved only on the battlefield. From 1782 until his death he was a judge in the superior court of New Hampshire.

Whip-Poor-Will (*hwĭp′po͝or-wĭl*), a bird native to North America. It was named from its cry, which resembles the words *whip poor will.* It is closely allied to the goatsucker of Europe. The length is about 10 in., with a wingspread of about 20 in. The plumage is tawny-brown and is much mottled with white and gray spots. A number of species have been described, all of which fly about in the evening in search of food. They skim along near the ground without making a noise, in order to catch the insects on which they feed. These birds retire into the woods during the day. Their familiar cry is heard mostly in the evening. They breed about the middle of May, incubating their eggs in rude nests on or near the ground.

Whirlpool (*hwẽrl′po͞ol*), an eddy or vortex in a river or in the sea, which is caused by the water flowing against a peculiarly formed bank, by the meeting of two currents, or by the action of winds upon currents and tides. Small whirlpools may be seen on nearly every stream, but they assume gigantic size in many places of the ocean and oceanic channels, where their motion attracts and engulfs floating objects. The most famous whirlpool in history is that of Charybdis, near Sicily, and another of considerable interest is the Maelstrom, in the Lofoten Islands, northwest of Norway. The latter was made the subject of a dramatic tale by Edgar Allan Poe. However, the danger from whirlpools has been greatly exaggerated.

Whirlwind (*hwûrl′wĭnd*), any revolving mass of air, including at one extreme the hurricane, and at the other the dust whirl of street corners. The term is usually applied, however, to small eddies of local origin, such as dust or sand whirls, often seen during a dry spell anywhere, and especially on level deserts. Whirlwinds seldom occur on hilly ground and never take place when a strong wind is blowing. They are usually formed when a portion of the surface of the earth becomes greatly heated, so that currents of air moving upward are replaced by a rush of air from all sides. All whirls of considerable size are given a uniform direction by the rotation of the earth, clockwise in the Southern Hemisphere and counterclockwise in the Northern Hemisphere. See also *Storm.*

Whisky (*hwĭs′kĭ*), or WHISKEY, an alcoholic distillate obtained from a fermented mash of grain. Its name is derived from the Celtic word *uisgebeatha,* meaning "water of life." Whisky originated in the British Isles and its use spread from there all over the world. The distillation process starts with the cooking of the grain with water and malt to a mash. The whisky thus gained consists of virtually pure alcohol, which is finally distilled when the mash is fermented with yeast. In this stage the whisky is tasteless and colorless. It is then mixed with water and poured into new oak barrels which have been carefully charred inside. Whisky's characteristic taste and its yellow or reddish-brown color results from the process of aging in the charred barrels.

Whisky falls into three classifications according to quality, kind, and type. The "quality" whiskies include *spirit whisky,* the lowest grade of whisky, consisting of neutral spirits with less than 20 per cent straight whiskey; *plain whisky,* aged less than two years; *straight whisky,* aged more than two years; *bottled in bond,* aged four years and more, under special strict government regulations, and *blended whisky,* a mixture of at least 20 per cent straight whisky, with other alcoholic distillate agents such as neutral spirits, water, sherry, etc.

The various "kind" whiskies include *Bourbon whisky,* which contains at least 51 per cent whisky distilled from corn mash; *corn whisky,* which contains at least 80 per cent whisky distilled from corn mash; *malt whisky,* which contains at least 51 per cent whisky distilled from (barley) malt; and *rye whisky,* which contains at least 51 per cent whisky distilled from rye mash.

The "type" whiskies consist of *American whisky,* including a great variety of types, made in America under regulations imposed by the Federal government; *Canadian* and *Irish whiskies,* made in Canada and Ireland respectively, and *Scotch Whisky* (*always* written without an "e"), a whisky which consists mostly of a blend of barley malt whiskies, aged at least three years in peat-smoked barrels. See *Alcohol.*

Whisky Insurrection (*hwĭs′kĭ ĭn-sûr-ĕk′-shŭn*), or REBELLION, a revolt in the U.S., due to the enactment of a Federal excise law. It took place in the western part of Pennsylvania, in 1794, when the authorities undertook to enforce the collection of taxes upon whisky. Congress passed this law in 1791 as a means of raising revenue and considerable opposition formed against it in Virginia, North Carolina, and Pennsylvania, where a large number of the people were engaged in distillation and whisky was used as a medium of exchange. The masses held insurrectionary meetings and a number of the revenue officers were tarred and feathered. President Washington sent a force of 15,000 men to quiet the revolt in October 1794, and the disturbances were suppressed. Several of the leaders were arrested and found guilty of treason, but President Washington pardoned them. The affair had a good influence upon the nation, since it showed that the new Federal government was strong enough to enforce its laws.

Whisky Ring (*hwĭs′kĭ rĭng*), the name applied to a combination of distillers and revenue officers at St. Louis in 1872, who joined forces to defraud the government of the internal revenue tax on distilled liquors. It spread to many parts of the country, with branches at Cincinnati, Chicago, Peoria, Milwaukee, and New Orleans, and even had agents in Washington to co-operate with certain government officials. Myron Colony, of the Cotton Exchange, was appointed to make a secret investigation of the frauds. The disclosures that followed implicated the private secretary of President Grant, the chief clerk of the Treasury Department, and many other government officials. Indictments were obtained against 238 persons, many of whom were convicted and fined. The amount involved in the frauds totaled $1,650,000.

Whist (*hwĭst*), a game played with the full pack of 52 cards, the forerunner of a similar card game called bridge (*q.v.*). The game requires four persons, of whom those sitting opposite each other are partners. At the beginning the pack is cut for partners; the two cutting respectively the highest and lowest cards play together, and the first deal is taken by the one who cuts the lowest card. After the cards have been shuffled carefully, the pack is cut by the adversary sitting on the right hand, and the cards are then dealt one by one to each of the players, commencing on the left, until the pack is exhausted. The last card, called the *trump,* is turned up by the dealer and remains exposed until the first trick is turned. In 1743 Edmond Hoyle published a set of rules in his "Short Treatise on the Game of Whist," and it remains substantially in force at the present time. However, the game is little played today.

Whistler (*hwĭs′lẽr*), JAMES (ABBOTT) MCNEILL, painter, etcher, and author, born in Lowell, Mass., July 10, 1834; died in London, July 17, 1903. During several impressionable years of childhood and early adolescence—while his father held the post of consulting engineer for the St. Petersburg & Moscow R.R.—young Whistler lived with his family in St. Petersburg. Here he continued drawing lessons, already begun in America, by studying at the Imperial Acad. of Fine Arts.

Courtesy Brooklyn Museum, N. Y.

JAMES McNEILL WHISTLER

Painting by Giovanni Boldini (1845-1931)

Whistler left the U.S. Military Acad., where he had been sent, in 1854. A brief experience as a wage earner in the drawing division of the U.S. Coast and Geodetic Survey proved useless. Convinced at last that her son was born to be an artist, and nothing but an artist, his mother joined with the rest of the family to help him do the one thing he really wanted to do—study art in Paris.

In the summer of 1855 Whistler left the U.S., never to return. During his first three years in Paris, in which he concentrated upon etching, Whistler became a leader in the gay, Bohemian life of the Latin Quarter. By 1859, already well known for his etchings, the young artist was also turning out portraits and other paintings. His first notable triumph came when his painting, "At the Piano," was accepted for the Royal Acad. Exhibition in London (1860), after having been rejected by the jury of the Paris Salon. For the next three years he spent part of his time in France, and part of it in London, which city became his home.

The extraordinary perfection of his dry-point etchings—many of them glorifying his beloved Thames—for a long time overshadowed his paintings, with their unusual handling of color In accord with his theory that painting should be like music, expressing moods or color harmonies rather than definite ideas or emotions, he gave many of his canvasses names which were simply musical terms, as (for example): "Harmony in Brown and Black," "Harmony in Gray and Green." He liked to work these canvases out with the subtle nuances possible only with a palette limited to one or two related color tones. During his London sojourn he launched his "Ten O'Clock" lectures, later published, and wrote a number of witty or satirical pamphlets such as "Whistler vs. Ruskin: Art and Art Critics." "The Gentle Art of Making Enemies" appeared in 1890, and another philippic, "The Baronet and the Butterfly," in 1899.

Among Whistler's most famous paintings are the "Little White Girl" (1865), the portrait called "The Artist's Mother" (1872), and the "Portrait of Thomas Carlyle" (1874). The "Portrait of Miss Alexander" and the fabulous "Peacock Room" decorations belong to a later period in his career, as does also his interest in lithography—an art in which he became so expert that many critics consider him its greatest master. In addition to many portraits of contemporary celebrities, and other paintings, Whistler left to posterity nearly 400 etchings and dry-points, and some 150 lithographs. Appreciation of his work has grown steadily since his death, the familiar portrait of his mother having been widely reproduced in America, especially on the "Mother's Day" U.S. postage stamp.

Whitaker (*hwĭt'ȧ-kẽr*), JOSEPH, publisher of periodicals, especially trade publications dealing with book selling, born in London, May 4, 1820; died at Enfield, May 15, 1895. From the time of his apprenticeship at the age of 14 to a Fleet Street bookseller in London, he was associated with the publishing business. In 1849 he originated the *Penny Post,* the first penny monthly church magazine. Another periodical, *Whitaker's Clergyman's Diary,* which he started in 1850, was still being brought out many years after his death. He published *The Artist,* a noted art review, from 1856-59. He became known in all English-speaking countries for his annual reference publication, *Whitaker's Almanack,* begun in 1869. His magazine, *Bookseller,* launched in 1858, was extensively circulated among booksellers, publishers, and book buyers generally for more than 40 years. His contributions to the book trade also included important collections of catalogues, issued at intervals for 20 years, beginning in 1874, listing the entire output of books in England. He was also highly regarded as an authority on copyright.

Whitby (*hwĭt'bȳ*), a once important seaport in Yorkshire, England, at the mouth of the River Esk on the North Sea. In the days of wooden ships it was a busy seaport and shipbuilding center, building among others the ships for the famous explorations of Capt. Cook. As iron ships increased, the importance of Whitby waned, and its last ship was launched in 1902. Its present prosperity rests on a lively fishing trade and on summer visitors. As a resort it is popular for the beauty of its seacoast and the famous Yorkshire moors inland. The quaintness of its historic streets adds to its charm. Accommodation for visitors runs from large hotels to simple rooms, and a youth hostel has recently been opened near the historic ruins of the abbey. Its parish church is noteworthy both for its design and its position on a 350-ft. cliff, reached by about 200 steep steps from the shore. Population, *ca.* 12,000.

White (*hwīt*), ANDREW DICKSON, educator and diplomat, born in Homer, N.Y., Nov. 7, 1832; died Nov. 4, 1918. He studied in the public schools of Syracuse and at Yale Univ., being graduated from the latter in 1853. In 1857 he became professor of history and English literature in the Univ. of Michigan and in 1867 was made president of Cornell Univ., a position which he held until 1885. On resigning the presidency, he made the university a gift of his historical library, about 30,000 volumes. He traveled in Europe from 1867-68, and served as a commissioner to Santo Domingo in 1871, and as minister to Germany from 1879-81. He served on the commission to investigate the Venezuela boundary line in 1896, and as ambassador to Germany from 1897-1902. He was president of the U.S. delegation to the Hague Peace Conference in 1899. White was honored by an appointment as regent of the Smithsonian Institution and as a member of the Legion of Honor of France. His writings include "History of the Warfare of Science With Theology," "Reminiscences of My Diplomatic Life," and "An Autobiography of Andrew Dickson White."

White, EDWARD DOUGLASS, chief justice of the U.S. Supreme Court, born in the Parish of Lafourche, Louisiana, Nov. 3, 1845; died May 19, 1921. The son of a former governor of Louisiana, he studied at Mt. St. Mary's Coll., Emmittsburg, Md., and at the Jesuit Coll. of New Orleans and Georgetown Coll., D.C. He served in the Confederate army, studied law after the close of the war, and in 1868 was admitted to the Louisiana bar. In 1874 he was elected state senator of Louisiana and four years later became an associate justice of the Louisiana supreme court. He succeeded James B. Eustis in the U.S. Senate as a Democrat in 1891, and was appointed associate justice of the U.S. Supreme Court by President Cleveland in 1894, and chief justice by President Taft in 1910. The first Southerner to serve as chief justice since Taney, he acquitted himself well. Generally considered a conservative, the majority of the cases he heard dealt with antitrust or labor legislation. He wrote the opinion upholding the constitutionality of the eight-hour day for railroad workers.

White, GILBERT, naturalist, born at Selborne, England, July 18, 1720; died June 20, 1793. He studied at Oriel Coll., Oxford, where he became a fellow in 1844, a position which he retained throughout his life. His most important work appeared in 1789 under the title "Natural History and Antiquities of Selborne," which contains interesting and valuable accounts of birds, insects, trees, and flowers.

White, HENRY KIRKE, poet, born in Nottingham, England, Mar. 21, 1785; died Oct. 19, 1806. He was apprenticed to a weaver, but afterward studied law. Several verses written in his 15th year were published in magazines and he became a regular contributor to the *Monthly Mirror*. A volume of poetry entitled "Clifton Grove" won for him a scholarship at Cambridge, where he became a tutor in mathematics.

White, HORACE, journalist, born at Colebrook, N.H., Aug. 10, 1834; died Sept. 16, 1916. He was graduated from Beloit Coll., Wisconsin, in 1853, and became a writer for the Chicago *Tribune*. In 1865 he became its editor and in 1883 accepted a position as editorial writer for the *Evening Post* in New York. He retired from the position of editor-in-chief in 1903, after which he gave his time largely to literature. His books include "The Roman History of Appian of Alexandria" and "Money and Banking Illustrated by American History."

White, HUGH LAWSON, politician, born in Iredell County, North Carolina, Oct. 30, 1773; died Apr. 10, 1840. He settled at Knoxville, Tenn., at an early age and in 1792 served as a volunteer against the Cherokee Indians. Later he studied law in Pennsylvania and began to practice in Knoxville, where he was made judge of the state supreme court in 1801. He was appointed U.S. district attorney in 1807, and became state senator two years later. In 1825 he succeeded Andrew Jackson in the U.S. Senate. He was nominated for President of the U.S. by the legislature of Tennessee in 1836, and carried the state by a large majority. The only other state he carried was Georgia, giving him a total of 25 electoral votes.

White, MARGARET BOURKE, photographer, born June 14, 1906, in New York City. She was educated at Columbia Univ., the Univ. of Michigan and Cornell Univ. She is famous for industrial photographs, taken all over the world, especially in Russia. She has, in addition, made two motion pictures of life in that country, "Eyes on Russia" (1931) and "Red Republic" (1934). She was associate editor of *Fortune* magazine from 1929-33 and after 1936 was associated with *Life* magazine, except for a brief period in 1940, when she served as chief photographer for the newspaper *PM*. During World War II she served as a war correspondent for *Life*. Books which she has illustrated with her photographs include "You Have Seen Their Faces" (1937), "Say! Is This the U.S.A.?" (1941), both with her former husband, Erskine Caldwell, and "Freighters of Fortune," "One Thing Leads to Another," and "They Called It Purple Heart Valley." In 1947 she published a collection of her photographs of postwar Germany, entitled "Dear Fatherland, Rest Quietly."

White, PEREGRINE, first person born in New England of English parents. The son of William and Susanna White, he was born on board the *Mayflower* on Nov. 20, 1620, while the ship was in the harbor of Cape Cod, Mass. To honor him the general court of the Plymouth colony subsequently granted him 200 acres of land. He was a leader in community and military affairs, and was active until his death in 1704, at the age of 84, at Marshfield, Mass. His mother, a widow after the first winter at Plymouth, married Gov. Edward Winslow in the first wedding to take place in New England.

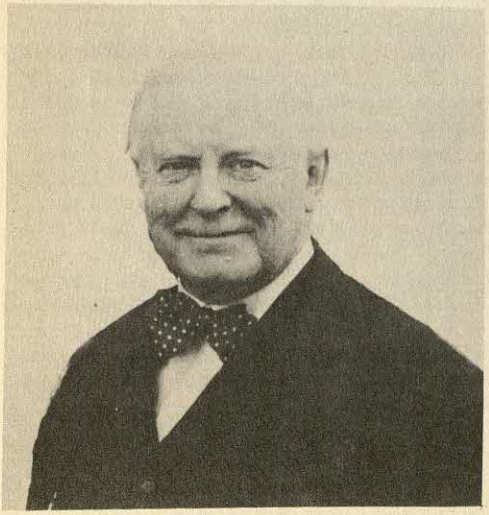
White, RICHARD GRANT, author, born in New York City, May 23, 1821; died there Aug. 8, 1885. He studied law and medicine, but soon turned to a literary career, although he was admitted to the bar in 1845. In 1846 he became connected with the *Morning Courier and New York Enquirer* as music critic, remaining with it until 1859 in that and other capacities. He was also noted as a musician. In 1853 he published his first volume, entitled "Handbook of Christian Art," and at the time of the Civil War he wrote "The New Gospel of Peace," a critical satire on Northern sympathizers with the Confederate cause. Many of his essays and criticisms were published in the *Atlantic Monthly* and in *Putnam's Magazine*. He was chief clerk of the marine revenue bureau of the New York custom house, 1861-78. His best-known works include "Words and Their Uses," "The Fate of Mansfield Humphreys," "England Without and Within," and "Studies in Shakespeare."

White, STANFORD, architect, born in New York City, Nov. 9, 1853; died there June 25, 1906. The son of Richard Grant White (*q.v.*), he was graduated from New York Univ., where he received his professional training under Charles D. Gambrill and H.H. Richardson. He was chief assistant to the latter in the construction of Trinity Church, Boston. In 1881 he joined the firm of McKim, Mead & White. He was the designer of many famous New York City buildings, including the old Madison Square Garden, Washington Arch, the Tiffany Apartments, the Century and Metropolitan Clubs, and the Columbia Univ. Library. He was killed in the Madison Square Garden by millionaire Harry K. Thaw.

White, STEWART EDWARD, novelist, born in Grand Rapids, Mich., Mar. 12, 1873; died Sept. 18, 1946. He was graduated from the Univ. of Michigan in 1895, and studied law at the Columbia Law School. He traveled in the western U.S., Africa, and the Yukon, using his experiences as source material for his later writings. His books include "The Blazed Trail" (1902), "Ranchero" (1933), and "Stampede" (1942). After the death of his wife, he experimented with psychic communication and wrote several books on the subject, among which was "The Unobstructed Universe" (1940).

White, WALTER FRANCIS, author and American Negro leader, born in Atlanta, Ga., July 1, 1893; died in New York City, March 21, 1955. Educated at the Univ. of Atlanta, he joined the National Assn. for the Advancement of Colored People, became an official of the organization in 1918, and served as its executive secretary from 1931, helping to build it into one of the nation's largest civil-rights organizations. White wrote a number of books, including "Fire in the Flint" (1924), "Flight" (1926), "Rope and Faggot—A Biography of Judge Lynch" (1929), "Rising Wind" (1945), and an autobiography, "A Man Called White" (1948).

White, WILLIAM, clergyman, born in Philadelphia, Pa., April 4, 1748; died there, July 17, 1836. In 1765 he was graduated from the Coll. of Philadelphia, and, after studying theology, he was ordained (1772) in the Protestant Episcopal Church. He was a leading figure in the organization of that church in the U.S. and drafted its first constitution. He was appointed first bishop of Pennsylvania, was one of two bishops consecrated (1787) in England by the archbishops of Canterbury and York, and collaborated on an American revision of the Book of Common Prayer. He served as congressional chaplain for many years. White was presiding bishop of the Protestant Episcopal Church in the U.S. from 1796 until his death.



WILLIAM ALLEN WHITE

Photo by Albert Cornmell, courtesy Macmillan, N. Y.

White, WILLIAM ALLEN, author and journalist, born in Emporia, Kans., Feb. 10, 1868; died there, Jan. 29, 1944. He was educated at the Univ. of Kansas and in 1890 went to work for the El Dorado *Republican*. From 1895 he was the owner and editor of the Emporia *Gazette*, a position in which he earned the nickname "the Sage of Emporia." He attracted nationwide attention in 1896 with an editorial entitled "What's the Matter with Kansas?", which was reprinted throughout the country and was credited with helping to elect William McKinley as President. In 1923 he received a Pulitzer Prize for an editorial entitled "To an Anxious Friend." White wrote many books, among them "The Court of Boyville" (1899), "A Certain Rich Man" (1909), a biography of Woodrow Wilson (1924) and two of Calvin Coolidge (1925, 1938), "The Changing West" (1939), and "The Autobiography of William Allen White" (published posthumously), which was awarded a Pulitzer Prize in 1947. "Mary White," an essay written on the death of his daughter (1921), is considered a classic.

Whitebait (*hwīt'bāt*), the young of certain species of herring, particularly the common herring, and the sprat. The fish are caught in large quantities at the mouth of the Thames River in England and are regarded as a delicacy. The name whitebait also is applied to various other species of food fish found in the waters of Japan, New Zealand, and the U.S.

White Caps (*hwīt' kăps*), a term formerly used in the U.S. for self-appointed law-enforcement groups, so called from the large white caps or hoods worn to conceal the members' identity. See also *Ku-Klux Klan; Vigilance Committee.*

Whitechapel (*hwīt'chăp-ęl*), a parliamentary district in East London, England, named for a chapel in the district, Whitechapel, and traversed by Whitechapel Road. The district adjoins the famous Tower of London; within it is London Hospital. It suffered extensive bomb damage during World War II, and much of the area, formerly slums, has been replanned and rebuilt.

Whiteface Mountain (*hwīt'fās*), one of the highest peaks in New York State, north of Lake Placid, in the Adirondack Mts. Rising to a height of 4,872 ft. above sea level, the mountain can be ascended by the Whiteface Mountain Memorial Highway, completed in 1935.

Whitefield (*hwīt'fēld*), GEORGE, religious leader and a founder of the Methodist movement, born in Gloucester, England, Dec. 16, 1714; died in Newburyport, Mass., Sept. 30, 1770. While attending Oxford Univ., he met the Wesleys, joined their Methodist group (which had grown within the Church of England), and was invited (after being ordained an Anglican deacon) to go to Georgia as a missionary. He had already begun to build a reputation as an evangelist when he left for America in 1737. Returning to England in 1738, he attracted huge audiences to his meetings, many of them held in the open air because the Anglican clergy refused to offer their pulpits to him. In 1741, after another visit to America, Whitefield broke his affiliations with Wesleyan Methodism, but not his friendship with John Wesley (*q.v.*), and became founder of the Calvinist Methodist movement.

Whitefish (*hwīt′fish*), the name commonly applied to several species of fishes of the salmon family. They are found mostly in the lakes of the northern regions of North America and are generally favored among the food fishes. About 20 species are native to the lakes of the northern part of the U.S. and Canada, and in many cases find their way far up the rivers and smaller streams. They usually weigh 12 to 14 oz., but the larger species reach 4 to 8 lbs. The common whitefish of the Great Lakes is the most important of the species. Other fishes frequently mentioned as whitefish include the menhaden, the silver salmon, the sewen, and the European whiting.

Whitehall (*hwīt′hạl*), a wide passage near Charing Cross, London, England, with government offices on either side, originally a royal palace. At the time of the Restoration the treasury and other government offices were moved to this section.

Whitehead (*hwīt′hĕd*), ALFRED NORTH, mathematician, logician, and philosopher, born at Ramsgate, England, Feb. 15, 1861; died at Cambridge, Mass., Dec. 30, 1947. He studied at Trinity Coll., Cambridge Univ., and after his graduation taught there from 1885 to 1911 as lecturer, and later senior lecturer, on mathematics. The young Bertrand Russell came under his tutelage (1890-94) as a student at Trinity Coll., and in later years the two became close personal friends. (For the story of their collaboration in the field of logic and the foundations of mathematics, culminating in the publication of *"Principia Mathematica,"* see *Russell.*) Whitehead left Cambridge in 1911 to become a lecturer at Univ. Coll., in the Univ. of London. He was professor of applied mathematics, and later chief professor of mathematics, at the Imperial Coll. of Science and Technology, of the same university, 1914-24. From 1924-36 he was professor of philosophy at Harvard Univ., and was professor emeritus at Harvard until his death.

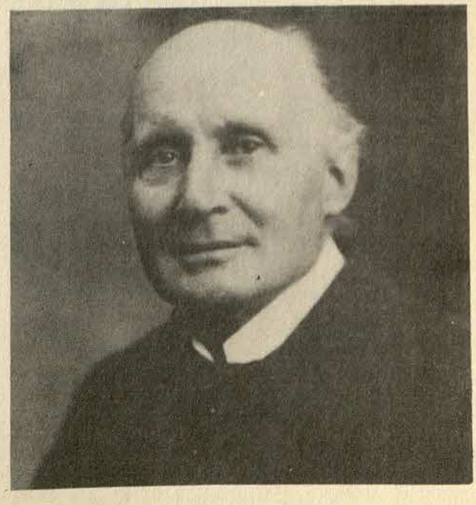
Among Whitehead's contributions to mathematics and mathematical physics may be mentioned his "A Treatise on Universal Algebra" (1898) and "The Principle of Relativity" (1922). Of popular character is his "An Introduction to Mathematics" (1911).

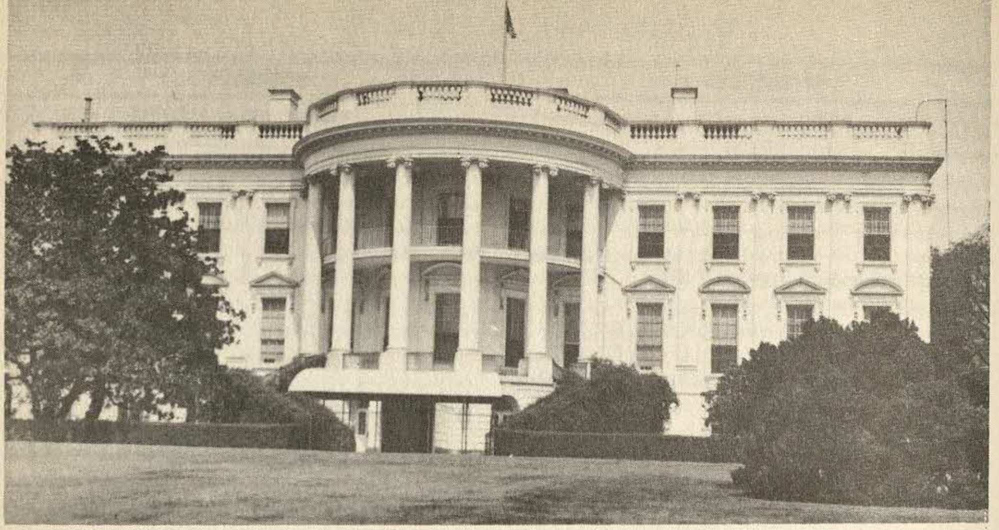
The beginning of Whitehead's search for the broadest and most basic concepts of nature may be seen in a technical article, "On Mathematical Concepts of the Material World" (addressed to mathematicians and physicists, and employing the logical notations of *"Principia Mathematica"*), which he published in the "Philosophical Transactions of the Royal Society of London" in 1906. Developed from ideas first appearing in this article, the "method of extensive abstraction" was later used by Whitehead as fundamental in his philosophy of science, notably in his books, "An Enquiry Concerning the Principles of Natural Knowledge" (1919) and "The Concept of Nature" (1920). By this method certain concepts which are ordinarily accepted uncritically in mathematical physics (the concepts, *e.g.,* of a point in space or in space-time, of an unextended particle, of an instantaneous state) are analyzed—in the sense that, in terms of objects which we actually perceive and of perceptible relations among them, entities are defined which serve the same theoretical purpose as points, particles, instantaneous states, etc., and which may therefore either replace the latter in the physical theory or be identified with them.

From the philosophy of natural science Whitehead went on in the latter part of his life to a more general concern with philosophy, including metaphysics, theory of knowledge, and philosophy of religion, and his work in these fields has earned him a place among the great philosophers of the present century. His important books of this period include "Science and the Modern World" (1925), "Religion in the Making" (1926), "Symbolism: Its Meaning and Effect" (1927), "Process and Reality" (1929), "The Function of Reason"

ALFRED NORTH WHITEHEAD

Photo by Notman, courtesy Macmillan, N. Y.





Wide World Photos

SOUTH PORTICO OF THE WHITE HOUSE

(1929), "Adventures of Ideas" (1933), and "Modes of Thought" (1938).

White House (*hwīt hous*), the official residence of the President of the U.S., in Washington, D.C., so called because it is painted white. Located on Pennsylvania Avenue, 1½ m. from the capitol, it is the oldest public building in Washington. Major l'Enfant, the French engineer, selected the site when he laid the plan for the city. George Washington approved it, and the architect, James Hoban, superintended the construction. It is of the classic style of architecture, and is said to have been modeled after the palace of the Duke of Leinster in Dublin. It is 170 ft. long and 86 ft. wide, and has a colonnade in front and a circular portico in the rear. Among its famous rooms are the East Room, the Green Room, used for informal receptions, the Blue Room, in which the President receives foreign diplomats coming to present their credentials, the Red Room, in which the First Lady receives guests by appointment, the State Dining Room, the Diplomatic Reception Room, and the Diplomatic Room. A park with beautiful gardens surrounds the building. A swimming pool, built by public subscription, is provided for the President's use.

The original structure was begun in 1792, when the cornerstone was laid, and the building was completed in 1800. John Adams was the first President to occupy the mansion. The British captured Washington in 1814 and burned the White House together with the capitol and other buildings, but its restoration was authorized by Congress the following year. In 1817 the new structure was occupied by President Monroe and has since been the official Presidential residence. The south portico was completed in 1824, the north portico in 1829. The east terrace was removed in 1869. During Theodore Roosevelt's administration a new office building was constructed at the west end of the west terrace, the east terrace was reconstructed and other improvements were made. A second story balcony on the south portico was built during President Truman's first administration. At the start of his next tenure, however, the Trumans were moved to Blair House, a government residence across from the White House, while repairs costing several million dollars were made on the official residence. See also *Washington, D.C.*

White Lady (*hwīt lā′dy̆*), in German legends, a feminine spirit who was said to appear at the approach of an important event. She is represented in story as robed in beautiful garments of white and at her side is a bunch of keys, with which she is able to open all doors. The most famous legend connected with the White Lady is that known as "Bertha of Rosenberg," in Bohemia, and next to it is Sir Walter Scott's "The White Lady of Avenel."

White Lead (*hwīt lĕd*), a dense, white powder, soluble in diluted nitric or acetic acid, but insoluble in water. It is manufactured by the joint action of carbonic dioxide and vapor of acetic acid on metallic lead. The most common process is to place rolled sheets of lead in earthen pots and pour over them a quantity of acetic acid; that is, vinegar. A large number of these pots are prepared and loosely covered with disks of lead, after which they are covered with refuse bark from tanneries and set away for a period of five to six weeks. In the meantime the substances undergo a slow oxidation and disengage carbonic dioxide, which in the presence of the vinegar converts the surface of the lead into carbonate. The pots are opened and the white lead is scraped from the remaining metal as soon as a considerable quantity of carbonate has been formed. A number of other processes are employed to manufacture white lead more cheaply, but this process results in the finest quality. White lead is used extensively in painting.

Whiteman (*hwīt′mạn*), PAUL, musician and orchestra leader, born in Denver, Col., Mar. 28, 1891. He was a viola player with the Denver Symphony Orchestra, the San Francisco People's Symphony, and others before organizing his own band in 1919. With this venture, he made a serious departure from the accepted forms and traditions of music, introducing new syncopations and rhythmic orchestrations that developed into modern jazz. Whiteman commissioned George Gershwin to write "Rhapsody in Blue," and his orchestra performed it for the first time (Feb. 12, 1924), and toured the U.S. and Europe, paving the way for the acceptance of jazz as a native American musical contribution. He is the author of "Jazz" (1926) and of "How to Be a Bandleader" (1941, with Leslie Lieber). His band began its regular radio appearances in 1926. In March 1943 he was appointed musical director of the Blue Network which later became the American Broadcasting Co.

Blue Network Photo

PAUL WHITEMAN

White Mountains (*hwīt moun′tĭnz*), a mountain chain of New England, situated chiefly in New Hampshire and belonging to the Appalachian highlands. It extends from eastern Maine nearly across New Hampshire, assuming the greatest heights and largest extent in the latter state. Mt. Katahdin, north of Millinocket Lake, is the highest elevation of eastern Maine, height 5,385 ft., and Mt. Washington, height 6,288 ft., is the most elevated peak of the mountain group. The latter is situated in north central New Hampshire and is a favorite summer resort. A cog-wheel railway was built to the summit of Mt. Washington in 1869. A station of the Federal Weather Bureau is located at the summit.

The western part of the White Mts. is known as the Franconia Mts. It contains Mt. Lafayette, whose summit is 5,270 ft. high, and a number of others which exceed 4,000 ft., including Profile, Liberty, and Moosilauke Mts. A celebrated natural feature of Mt. Profile, consisting of three projecting rocks, resembles a human profile and is known as the *Old Man of the Mountain*. Hawthorne based his allegorical tale, "The Great Stone Face," on this phenomenon. The summits of the White Mts. are generally rocky and bare, but the slopes were originally covered by fine forests, of which some traces remain, and some are being restored by the government.

White Plains (*hwīt plānz*), county seat of Westchester County, New York, 22 m. N.E. of New York City, on the New York Central R.R. It is a suburban residential city, and the shopping center for Westchester County. It is the seat of Good Counsel Coll., a state technical institute, Westchester County Center, and the Westchester Branch of the New York Hospital. White Plains is noted as the scene of a battle in the Revolution, which occurred Oct. 28, 1776. The place was held by the Americans under Washington and was attacked by the British under Howe, who came from New York intending to break the blockade by getting in the rear of the American position. Though the latter obtained possession of an unimportant outpost, Washington held the grounds commanding White Plains until November, when Howe fell back to Dobbs Ferry and Washington removed his troops to New Jersey. The place was incorporated as a village in 1866 and as a city in 1916. Population, 1950, 43,466.

White River (*hwīt rĭv′ẽr*), a stream of Indiana, formed by two branches near the eastern boundary of the state, near the border of Pike County. It has a general course toward the southwest until it joins the Wabash opposite Mt. Carmel, Ill. From the junction of the two branches to its mouth is a distance of 50 m. The entire length, including the West Fork, is 350 m. Indianapolis is the chief city on the West Fork.

White River, a river of the U.S., which rises in the Ozark Mts. of Arkansas and flows into the Mississippi near the mouth of the Arkansas River. It first flows toward the northeast, making a large curve through Missouri, but most of its course is toward the southeast. The White River is 800 m. long, of which 350 m. are navigable. The Black River, which rises in southern Missouri, is its chief tributary. A large portion of the White River Valley is fertile, producing cereals, cotton, tobacco, grasses, and fruits.

White Russia (*hwīt rŭsh′ȧ*). See *Byelorussian Soviet Socialist Republic.*

White Russians (*hwīt rŭsh′ạnz*), considered by some ethnologists to be the purest of the large divisions of the Slav race residing in Russia, *i.e.*, the Great Russians, the Little Russians and the White Russians. This eastern Slav group inhabits the region bordering on the Polish and Latvian frontiers, known as the Byelorussian Soviet Socialist Republic. They are brachycephalic (broad-headed), the cephalic index averaging about 85; their coloring is generally fair with light brown or reddish brown hair and light brown eyes. The name may have been derived from the white clothing usually worn in that region: white smock, leggings and coat. The name was also applied to those persons who opposed the "Red" Bolsheviks after the revolution of 1917. See also *Russia; Union of Soviet Socialist Republics.*

White Sands Proving Ground (*hwīt săndz pro͞ov'ĭng ground*), focal point of rocket testing by the U.S. Army Ordnance Dept., located 28 m. from Las Cruces, N.M. It is east of the Organ Mts. which combine with two other mountain ranges to provide observation posts for tracing the flight of guided missiles. The 877,000-acre proving ground, established in 1945, is 125 m. long, by 41 m. wide at its widest point. Traversed only by a single highway, this sandy desert area can be easily closed to traffic during the guided-missile tests. The cantonment site, 6 m. from the technical area devoted to the firing and the firing controls of the missiles, provides quarters for approximately 1,000 enlisted personnel, officers, and visitors. It has hospital and recreational facilities, in addition to all the warehouse, laboratory, and working facilities required. All firing is directed from a bombproof blockhouse in the center of the firing area, and the rockets are fired from a massive concrete and steel launching platform. It is expected that the proving ground will be useful for many years as a facility for testing: (1) Anti-aircraft, or ground-to-air, missiles; (2) short- and medium-range ground-to-ground missiles; (3) meteorological rockets; (4) scale models of very-long-range missiles; (5) experimental rockets as test vehicles for components, such as control systems. See also *Military and Naval Progress; Missile; Rockets.*

White Sea (*hwīt sē*), an inlet of the Arctic Ocean, in northern Russia, sometimes called the Gulf of Archangel. It extends inland for a distance of 380 m., varies in breadth from 30 to 150 m., and has an area of 46,500 sq. m. The Gulf of Kandalasksha is in the northwestern part and Onega Bay is in the southwestern part. The coast line, 975 m. long, is largely precipitous. Into it flow the Mezen, Dvina, Onega, and Wyg Rivers. Though the surface is frozen from October to May, it is important for commercial purposes and contains excellent cod and herring fisheries. It is connected by canals with the Volga and Dnieper, thus bringing it into direct communication with the Black and Caspian Seas.

White Slave Traffic Act (*hwīt slāv trăf'ĭk ăkt*), also known as the MANN ACT, originated by James Robert Mann (1856-1922) and passed by the U.S. Congress in 1910, following disclosures by the Federal Immigration Commission of enforced prostitution. The act prohibits both foreign and interstate commerce in women, and fixes severe penalties on the transportation over a state border of girls or women for immoral purposes. See also *Prostitution.*

White Sulphur Springs (*hwīt sŭl'fŭr sprĭngz*), a town in Greenbrier County, West Virginia, about 90 m. S.E. of Charleston on the Chesapeake & Ohio R.R. It is a celebrated health resort whose medicinal springs have been popular since the American Revolution. Since the President's Cottage was built (1816) many U.S. Presidents have summered here. Population, 1950, 2,643.

Whiting (*hwīt'ĭng*), a fish closely related to the cod, but differing from it in not having a barbel on the lower jaw. The body is moderately long and covered with small scales; the upper jaw protrudes, and the mouth is deeply cleft. It is usually from 12 to 16 in. long and weighs from 1 to 3 lbs. The whiting is abundant off the shores of Northern Europe and Great Britain. The name whiting is often applied to the hake and the kingfish of North America.

Whitman (*hwĭt'mạn*), a town in Plymouth County, Massachusetts, 21 m. S.E. of Boston, on the New York, New Haven & Hartford R.R. The manufactures include boots and shoes, hardware, wire nails, electrical appliances, clothing, and machinery. Originally the town was a part of Abington. Incorporated as South Abington in 1875, it adopted the present name in 1886. Population, 1950, 8,413.

Whitman, CHARLES OTIS, zoologist, born in Woodstock, Me., Dec. 14, 1842; died Dec. 6, 1910. He was graduated from Bowdoin Coll. in 1868 and subsequently from the Univ. of Leipzig, and in 1880 was made professor of zoology at the Imperial Univ. of Tokyo, Japan. From 1883-85 he was assistant in zoology at Harvard Univ.; from 1886-89 was director of the Allis Lake Laboratory at Milwaukee, and from 1890-92 professor of zoology at Clark Univ. He was made professor of zoology in the Univ. of Chicago in the latter year, in which position he did much to extend knowledge in particular lines of embryology and the anatomy of fishes. Among his many publications were "The Seat of Formative and Regenerative Energy," "Evolution and Epigenesis," and "Animal Behavior."

Whitman (*hwĭt'mạn*), MARCUS, pioneer and missionary, born at Rushville, N.Y., Sept. 4, 1802; killed by Indians, Oct. 29, 1847. After studying to be a physician at Berkshire Medical Institution in Pittsfield, Mass., he practiced medicine for four years in Canada. In 1834 he volunteered to do missionary work for the American Board of Commissioners for Foreign Missions. His first venture took him in 1835 into the almost unexplored region then known as the Oregon country, now comprising the States of Oregon, Washington, and Idaho. He did not penetrate far, but a yeaı later he returned with his wife and three fellow missionaries. They were the first pioneers to reach the territory around the upper Columbia River by prairie wagon. Settling near what is now Walla Walla, Wash., they worked among the Indians, and other missionaries, fur traders, and farmers from the East began to settle there in large numbers. In 1842-43, when the board decided to discontinue the work, partly because of disagreements among the missionaries, Whitman made a "winter ride" to Boston, where the decision, upon his request, was reversed. He also conferred in Washington with the Secretary of War. Before returning to the Northwest he was able to influence a large group of new settlers to follow him. In 1847 he, his wife, and 12 other persons in their settlement were killed by Cayuse Indians.

Whitman, WALT(ER), poet and prose writer, born in West Hills, Long Island, N.Y., May 31, 1819; died in Camden, N.J., Mar. 25, 1892. His parents, of English, Dutch, and Welsh stock, belonged to the Quaker branch of a colonial family. In 1823 they moved to Brooklyn, where Whitman was later employed as an office boy and printer's devil. Until the late 50's, he held editorial positions on several newspapers in and around New York. During this period he taught school twice and made a trip to New Orleans.

The first edition of his famous work, "Leaves of Grass," for which Whitman himself set the type, was published in 1855. It was reissued frequently, with additions and revisions, between 1855 and 1881. A complete edition contains all of Whitman's poetry. The sources of his inspiration probably lay largely in personal experience. Certainly "Leaves of Grass" is recognized today as the most original and also the most authentically American volume of poetry which has yet appeared in this country. And yet, except for Emerson's enthusiastic response to the first edition, American critics, in general, during the author's life, were either indifferent or contemptuously abusive. Success came earlier in Europe than in the U.S.

During the Civil War Whitman worked as a volunteer nurse in Washington hospitals. In 1865 he found a position as a clerk in the Department of the Interior and, later, in the Attorney General's office. A prose work, "Democratic Vistas," appeared in 1871. Whitman continued his work as a clerk until he was struck by paralysis in 1873. When he began to recover from this affliction, he made trips to Camden, N.J., to the West and into Canada. Another important prose work, "Specimen Days and Collect," was published in 1882. In 1884, he bought a house in Camden and remained there until his death.

WALT WHITMAN

Whitman's social and philosophical outlook runs the gamut from excessive egoism to a tremendous breadth of social democracy. The egoism in "Song of Myself" (1855) broadens, in "Out of the Cradle Endlessly Rocking" (1859), to a view of the individual as dependent upon love and artistic creation. The comradeship and love is further developed in "Whoever You Are Holding Me Now in Hand" (1860) and "Starting From Paumanok" (1860). Panoramas of society in the mass, international as well as national, may be seen in "Salut au Monde!" (1856) and in "Pioneers! O Pioneers!" (1865).

The poet's experiences during the war contributed largely to the growth of his social outlook. His Quaker background may have encouraged an antipathy to war, and he was never a bitter opponent of the South, or a constant friend of the abolitionists. Indeed, at first he does not seem to have been an uncompromising enemy of slavery. On this score, however, his attitude changed. Thus, his condemnation of Daniel Webster for supporting the Fugitive Slave Act was as severe as Whittier's. His hospital service was a devoted and substantial contribution to the war effort. Moreover, his contact with the suffering induced by war, and the growth of his admiration for Lincoln, matured certain qualities of humaneness and compassion. Among the best of his war poems are "Over the Carnage Rose Prophetic a Voice" (1860), "Come Up From the Fields, Father" (1865), "The Wound-Dresser" (1865), "Turn O Libertad" (1865), and the two great funeral orations for Lincoln: "When Lilacs Last in the Dooryard Bloom'd" (1865) and "O Captain! My Captain!" (1865).

In evaluating Whitman's artistic achievement, we must keep in mind that he had set himself the task of creating the literature of a new world, of reflecting as simply and candidly as possible the total extent of a nation founded on the concept of democracy. He wanted to represent all areas and classes, to voice a hymn in praise of brotherly love which, in the end, must necessarily overflow even the boundaries of the nation in which it had its origin.

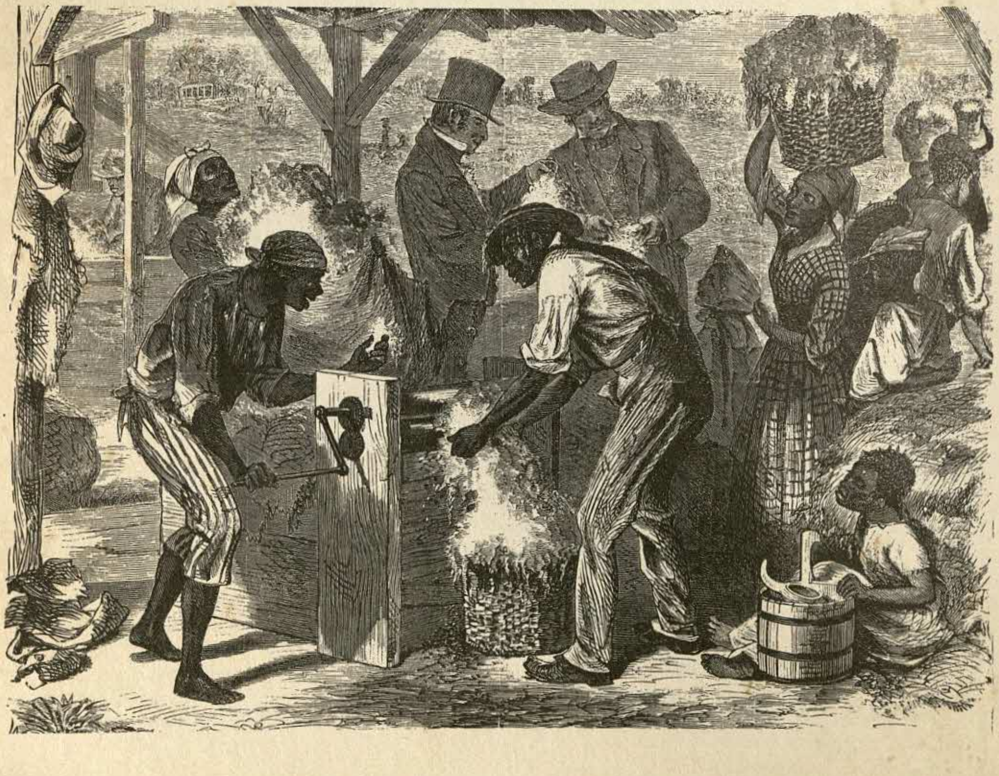
To attain this objective, he felt the need to create a new style, a verse form which, though it echoed the devices of repetition and parallelism employed in the Bible, may be better described as the earliest American experiment in free verse. Whitman has often been condemned for the looseness and crudeness of this style, for the popularity and frankness of the language, for the lengthy "catalogues"—loose and unassimilated lists of miscellaneous detail. The power of his expression, however, together with his great lyric and oratorical gifts and his all-encompassing democracy—national and international, urban and rural—are winning him an increasingly high reputation in the history of American literature.

Whitney (*hwĭt′nĭ*), ELI, inventor, born in Westborough, Mass., Dec. 8, 1765; died in New Haven, Conn., Jan. 8, 1825. He worked his way through Yale Univ., teaching school and doing odd jobs during vacations. He was graduated in 1792 and afterward taught school in Georgia. While in the South he was assisted by the widow of Gen. Nathanael Greene, a Revolutionary War officer, who enabled him to study law. Whitney observed that the process of separating the cotton from the seed by hand was slow and expensive and accordingly undertook to invent a machine that would do the work. Since he was limited in means, he was obliged to make his own tools and prepared much of his mechanism by hand. When his machine was nearly completed, some one broke into his workshop and stole his devices, enabling others to copy them and get machines made before he could have his own invention patented.

In 1793 Whitney finally completed the cotton gin and was voted a fund of $50,000 by the State of South Carolina to develop its manufacture. Though the invention of the cotton gin was one of the most important connected with the cotton industry, he got little profit out of it, as he was obliged to defend his rights by many expensive

ELI WHITNEY'S FIRST COTTON GIN

Illustration from *Harper's Weekly*, October 18, 1869



PYRAMID

SPHINX

Ca. 2800 B.C.

GREEK TEMPLE
5th cent. B.C.

COLOSSEUM, ROME
A.D. 70-82

CHINESE PAGODA
Traditional

ARCH OF TITUS, ROME
A.D. 81

JAPANESE TEMPLE
Traditional

HAGIA SOPHIA, ISTANBUL
532-537

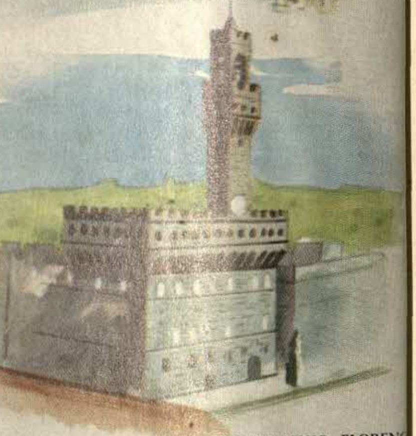
LEANING TOWER, PISA
12th-14th cent.

NOTRE DAME, PARIS
1163-14th cent.

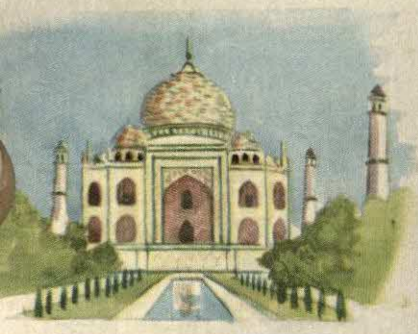
ARCHITECTURE I

ST. PETER'S, ROME
1506-1626

AMBETH PALACE, LONDON
th-16th cent.



PALAZZO VECCHIO, FLORENC
12



AJ MAHAL, INDIA
32-1653

EMPIRE STATE BUILDING
NEW YORK
1930-31

PALACE OF VERSAILL
1656-16

NEW ENGLAND CHURCH
8th cent.

MOUNT VERNON, VIRGIN
18th c
Piazza railing removed, 1

ARCHITECTURE II

lawsuits against the claims of others. The government gave him a contract for the manufacture of firearms and he established himself at Whitneyville, Conn., where he made a fortune by adapting ingenious machinery for manufacturing the different parts of firearms. He was one of the first American manufacturers to apply the idea of division of labor, and his use of interchangeable gun parts may be said to have been the first notable step toward mass production, which later became the basis of modern American industry. Macaulay said of him, "What Peter the Great did to make Russia dominant, Eli Whitney's invention of the cotton gin has more than equaled in its relation to the power and progress of the U.S."

Whitney, GERTRUDE VANDERBILT, sculptor and patron of the arts, born in New York City about 1877; died there Apr. 18, 1942. She was a great-granddaughter of Commodore Cornelius Vanderbilt, an heiress in her own right, and she married (1896) one of the wealthiest men in the country, Harry Payne Whitney. She studied sculpture and received her first recognition in 1908, when a statue won a prize. After that time she received numerous commissions; her major work included two statues for the New York World's Fair, "To the Morrow" and "Peter Stuyvesant," monuments to Columbus and to Buffalo Bill, the Aztec Fountain in the Pan-American Building in Washington, D.C., the Titanic Memorial in that city, and the memorial to the American Expeditionary Force over the harbor in St.-Nazaire, France. In 1908 she established the Whitney Studio and this project was later expanded, culminating in 1931 in the Whitney Museum, New York City, a museum devoted solely to the works of American artists. The Whitney Museum was consolidated with the Metropolitan Museum of Art in 1943.

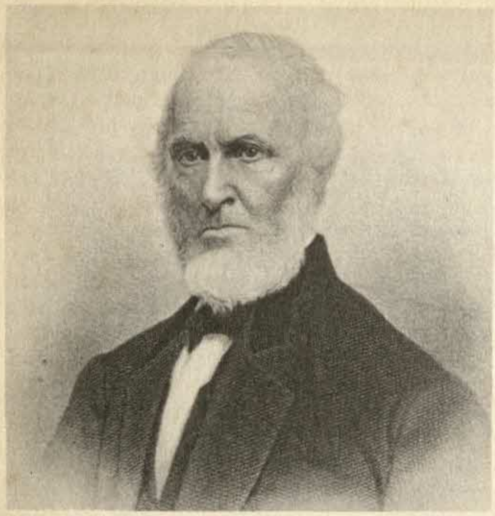
Whitney, WILLIAM COLLINS, politician, born at Conway, Mass., July 5, 1841; died Feb. 2, 1904. He studied at Yale Univ. and at the Harvard Law School and in 1865 began to practice law in New York City. In 1872 he was made inspector of the city schools and three years later became corporation counsel. In city politics he opposed the "Tweed Ring." President Cleveland appointed him Secretary of the Navy in 1885, in which position he promoted the movement to construct larger vessels for the navy. In 1892 he managed the campaign for the Democratic party. He was identified with numerous financial projects and enterprises in New York. He was widely known as a sportsman, maintaining one of the best racing stables in the country. His son, Harry Payne Whitney (1872-1930), was trained to take over his father's multimillion dollar interests, and was for a while associated with the Guggenheim interests in the ownership of mining property in the Western U.S. and Mexico. He was a noted polo player and was captain of the American team which won the international cup in 1906. He continued his father's racing stables, training some of the finest horses in racing history. In 1921-22 he financed an expedition to the South Seas for the American Museum of Natural History to collect birds of Polynesia.

Whitney, WILLIAM DWIGHT, philologist, born in Northampton, Mass., Feb. 9, 1827; died June 7, 1894. He was a brother of Joshua D. Whitney (1819-96), the geologist, and was educated at Williams Coll., Williamstown, and at Yale Univ. In 1850 he went to Germany, where he studied Sanskrit and other languages in Berlin and Tübingen, and in 1854 became professor of Sanskrit in Yale Univ. He was made professor of comparative philology in that institution in 1870. Whitney had more than a national reputation as a writer and an expositor of the science of language. His chief works include: "German Grammar," "Sanskrit Grammar," "Life and Growth of Languages," "German Reader," and "Oriental and Linguistic Studies." He was the chief editor of the "Century Dictionary," published in 1891.

Whitsunday (*hwĭt′sŭn-dĭ*), another name for Pentecost Sunday. This is the 50th day after the Resurrection of Jesus Christ and coincides with the Jewish Feast of Weeks. The Jewish Feast of Weeks was the festival of offering the first-fruits of the spring harvest to the Lord. Cf. Exodus 34:22 and Deuteronomy 16:10. It was on this day, the 50th after the Passover (and hence called in Greek *Pentekostes*), that the Holy Spirit descended on the Apostles (Acts 2:1). It was called Whitsunday because of the white baptismal garments worn by those who had been baptized on the previous Saturday.

Whittier (*hwĭt′ĭ-ēr*), JOHN GREENLEAF, poet, born near Haverhill, Mass., Dec. 17, 1807; died in Hampton Falls, N.H., Sept. 7, 1892. He was born of a long line of Quaker farmers who had lived in the same farmhouse, near Haverhill, since 1688. His first poems, written with chalk and charcoal on the beam of his mother's loom, were imitations of Robert Burns, by whom he was deeply influenced. In later years, he worked as a shoemaker to finance his meager education at Haverhill Acad. Although Whittier's health had been permanently damaged by heavy farm work and exposure to the New England winters, he had, nevertheless, a long and active career as journalist, politician, and poet. He was several times deeply in love, but he never married. During his last years, enthroned as sage and patriarch in a neighborhood grocery store at Amesbury, he was one of the most widely loved men in New England.

Although Whittier was a Quaker non-resister, he was always an aggressive defender of social reforms. It was primarily as a journalist that he took action in favor of humane treatment of the



JOHN GREENLEAF WHITTIER

Indians, woman suffrage, the care of the blind, and, particularly, the abolition of slavery. He was editor, successively, of the Boston *American Manufacturer,* the Haverhill *Gazette,* and the Hartford *New England Review.* His first efforts in favor of abolition came in 1833, when he wrote "Justice and Expediency." In 1835 and 1836, he found another avenue of expression as a member of the Massachusetts legislature. When this service had terminated, he edited the *Pennsylvania Freeman* for three years, and was later associated, for 14 years, with the *National Era.*

His earliest collection of prose and verse was "Legends of New England" (1831). Until the close of the Civil War, however, his verse was concerned mainly with the slavery issue. Poetry on this theme may be found in: "Voices of Freedom" (1846), "Songs of Labor" (1850), and "In Wartime" (1864). Later volumes show a predominating interest in memories of his New England childhood: "Home Ballads" (1860), "Snow-Bound" (1866), and "Among the Hills" (1869). His extensive acquaintance with colonial New England may be seen in "Moll Pitcher" (1832) and in one of his finest prose works, "Letters from Margaret Smith's Journal" (1848).

Whittier's poetry is not distinguished for freshness of diction nor for unusual skill in the use of verse forms. To some extent, his deficiency as a craftsman may have been due to the fact that he was partially deaf and completely color-blind. More important is the fact that he wrote too easily and too much. There was a kind of grandeur, however, in the moving sincerity of such political poems as "Ichabod," and his poems of the war, of rural life, and of childhood are among the best loved in the language. Some of the best known are: "Barbara Frietchie," "Maud Muller," "In Schooldays," "The Barefoot Boy," "My Playmate," and "Telling the Bees."

Whittington (*hwĭt′ĭng-tŭn*), SIR RICHARD (DICK), mayor of London, born in Pauntley, England, about 1359; died in 1423. He was the son of Sir William Whittington, who lost his estate on account of political complications. In 1379 he was able to loan five marks, which he had saved by working for a merchant, and henceforth fortune smiled upon him. He was elected alderman of London in 1392 and was chosen mayor of the city four different times. In 1416 he became a member of Parliament and was subsequently knighted by Henry V. From personal savings he was able to make loans to Henry IV and Henry V, the latter granting him a lien on the customs of London as security.

Whittle (*hwĭt′'l*), FRANK, inventor of the first successful jet propulsion airplane engine, born June 1, 1907, in Coventry, England. He was educated at Leamington Coll., the Royal Air Force Coll., and Cambridge Univ. He began work on his idea for a jet-propelled airplane engine in 1929, taking out his first patent on the invention the following year. For a time he was a test pilot at the R.A.F.'s Marine Aircraft Experimental Establishment, but he soon formed his own company, Power Jets, Ltd., to make jet engines. After 1937 he was placed on the Special Duty List and attached to his concern with the assignment of developing an aircraft gas turbine for jet propulsion. In 1939, Power Jets, Ltd., was assigned, by the British Air Ministry, to make a jet engine for installation in an experimental plane, and in 1941 the completed plane made its first successful flight. Whittle served in World War II, becoming an air commodore in 1944.

Whitty (*hwĭt′ȳ*), DAME MAY, actress, born June 19, 1865, in Liverpool, England. She became an

DAME MAY WHITTY

Courtesy Metro-Goldwyn-Mayer

actress at 16 and had already been on the stage for many years when she married the actor, Ben Webster. Their only daughter, Margaret Webster (*q.v.*), later became a director. Dame May played with many of the most noted actors of the 19th century, including Henry Irving, Helen Terry, and Richard Mansfield. She took the leading role in William Butler Yeats' "The Countess Kathleen" at the opening performance, in 1899, of the Irish Literary Theater, later known as the Abbey Theater. She was made a dame commander of the British Empire in 1918. In 1937, after more than half a century on the stage, she won overnight success as a motion-picture star for her performance in "Night Must Fall," in which she had previously appeared on the stage in both New York and London. Later motion pictures in which she took leading roles include: "The Lady Vanishes," "Suspicion," "Mrs. Miniver," and "My Name Is Julia Ross." In 1945, she appeared on Broadway in "Thérèse," which was directed by her daughter. She died on May 29, 1948.

Whooping Cough (*hwōōp′ĭng ķôf*), or PERTUSSIS, an acute infectious and contagious disease of the respiratory tract characterized typically by series of repeated spasmodic coughs followed by a sudden forceful inspiration (the whoop) and sometimes by vomiting. Quiet periods of a few minutes to four or five hours may occur between these periods of coughing and whooping. The disease is caused by a specific microbe, called the *Hemophilus pertussis*. Cases may occur sporadically or in epidemics in the more thickly populated areas of most parts of the world every two to four years. Infants under two years of age are very susceptible and most fatalities occur in the age group of under six months.

Though it usually occurs but once in the life of an individual and generally during infancy, some persons are attacked two or more times. It is most frequent in the spring and autumn. The symptoms are similar to those of a severe cold and the cough peculiar to the affection appears at the end of five or six days, accompanied by a watery discharge from the nose and eyes, considerable feverishness, and an oppressive feeling in the chest. The condition lasts usually from three to four weeks, but in some cases it continues much longer, sometimes even two months. Ordinarily the disease is not dangerous, but it is sometimes complicated with bronchitis, pneumonia (*q.v.*), ear infections, convulsions, or hernia (due to the strain of repeated severe coughing). Occasionally there may occur hemorrhages of the nose, throat, or eyes due to congestion of vessels associated with severe coughing. Whooping cough should be suspected in anyone, especially children, suffering from a cough of more than one week's duration. Infants, particularly those less hardy, should be protected from exposure, and specific immunization with pertussis vaccine should be given between the ages of 6 and 12 months (see *Vaccination*).

Treatment of the active disease, under proper medical supervision, includes rest in bed, fresh air and sunshine, frequent small feedings, use of an abdominal support, suction of mucus from the pharynx and trachea, and proper use of sedatives to relieve coughing and allow rest and sleep. Vaccines are useful provided the patient has had some previous immunization. Immune serum (derived from the blood of one who has had the disease) is helpful. Sulfadiazine and penicillin are used to treat concurrent complicating conditions such as ear infections or pneumonia.

Whortleberry (*hwûr′t′l-bĕr-rȳ̆*), the name of any plant of an extensive genus of shrubs, more commonly known as huckleberry (*q.v.*).

Wichern (*vĭķ′ẽrn*), JOHANN HEINRICH, philanthropist, born in Hamburg, Germany, Apr. 21, 1808; died there Apr. 7, 1881. After attending the public schools, he studied theology in Göttingen and Berlin, and in 1833 established near Hamburg a reformatory for children, known as the *Rauhes Haus*. The institution is organized on the plan of the industrial schools, giving the inmates the elements of an education along with training in various industries. In 1844 he established a monthly periodical, known as the *Publication of the Rauhes Haus*. He was later chief of the penal and correctional institutions of Prussia.

Wichita (*wĭch′ĭ-tâ*), the largest city in Kansas, seat of Sedgwick County, in the south central part of the state, at the junction of the Arkansas and Little Arkansas rivers, 160 m. s.w. of Topeka. It is served by the Missouri Pacific, the Atchison, Topeka & Sante Fe, the St. Louis & San Francisco, the Chicago, Rock Island & Pacific, and other railroads. Wichita Airport is 5 m. s.w. of the city.

With an area of 50 sq. m., Wichita devotes 11 sq. m. to its park system. It is the seat of the Univ. of Wichita, Friends Univ., and Sacred Heart Coll. Cultural facilities include the Wichita Art Museum. The city is also the site of the Inst. of Logopedics (for the study of speech defects). Among points of interest are Cow Town, a restoration of Wichita as it existed from 1869 to 1884; and a plaque marking the beginning of the Chisholm Trail, opened in 1865 (see *Chisholm, Jesse*).

Wichita is one of the world's major airplane manufacturing cities. Other industries are flour-milling (the world's largest grain elevator under one roof is in Wichita), meat-packing, printing, oil refining, and the manufacture of fabricated metals, machinery, and chemicals. The surrounding area is rich in minerals, including oil, gas, gypsum, salt, and cement. It is also an important agricultural region, producing wheat, barley, sorghums, alfalfa, livestock, and poultry. In 1958 the city had a value added by manufacture of $140,189,000. It is the center of the Wichita Standard Metropolitan Statistical Area (1960 pop., 343,231), which includes all of Sedgwick County.

A trading post was established here in 1864; and Wichita was platted in 1870. With the completion of the railroad in 1872 it became the chief market for longhorn cattle coming over the Chisholm Trail from Texas. The city is governed under the city manager-commission system.

In 1900 Wichita had a population of 24,671; in 1940, 114,966. The city's decade of greatest growth was between 1950, when the population was 168,279, and 1960, when it reached 254,698.

Wichita, a tribe of North American Indians, formerly resident in the portion of Oklahoma that lies between the Red and the Wichita Rivers, including the region of the Wichita Mts. According to tradition, they migrated north from Louisiana and settled in Arkansas, after which they crossed north to the region lying beyond the Red River. In 1859 they were assigned to a reservation on the north side of the Wichita, in the vicinity of Anadarko, Okla.

Wichita Falls, a city in north central Texas, seat of Wichita County, on the Wichita River, 114 m. N.W. of Ft. Worth. It is served by the Burlington Lines and the Missouri-Kansas-Texas R.R. (freight). Sheppard Air Force Base is nearby.

In addition to many parks, Wichita Falls has a popular recreational area adjoining on the south at Lake Wichita, created in 1900 by the damming of Holliday Creek. To the west, dams on the Wichita River have created Lake Kemp and Diversion Reservoir. The city is the seat of Hardin Coll., a municipal junior college; and of the state mental hospital.

Wichita Falls is an important manufacturing, trading, and oil center, as well as the financial center for the surrounding area, which produces oil as well as such agricultural products as wheat, cotton, and livestock. The chief industries are oil-refining, food-processing, and the manufacture of oilfield equipment and clothing. In 1958 Wichita Falls had a value added by manufacture of $26,226,000. It is the center of the Wichita Falls Standard Metropolitan Statistical Area (1960 pop., 129,638), which includes all of Archer and Wichita counties.

Founded in the 1870's, Wichita Falls was incorporated as a city in 1889. It has a city manager-council form of government. In 1900 the population was 2,480; in 1940, 45,112. The city's decade of greatest growth was between 1950, when the population was 68,042, and 1960, when it was 101,724.

Widgeon (*wĭj'ŭn*), a genus of river ducks, closely allied to the teal and the gadwall. The bill is shorter than the head. It is of equal width throughout and the tip is much rounded. The wings are long and pointed and the toes are fully webbed, but the hind one is lobed. Ten species have been described, nearly all of which are found in the colder regions and usually on the margins of rivers and lakes. The *baldpate,* an American species, is about 22 in. long and is found in Canada and the northern part of the U.S., especially in Minnesota. In winter it migrates southward to the interior of the U.S.

Wieland (*vē'länt*), CHRISTOPH MARTIN, poet and novelist, born in Oberholzheim, Germany, Sept. 5, 1733; died at Weimar, Jan. 20, 1813. He was the son of a pastor, under whose direction he received a careful primary training. After spending several years at the school of Kloster Bergen, near Magdeburg, he entered the Univ. of Tübingen with the view of studying law, but most of his time was devoted to literature. By the time he was 16 he had already read the Roman classics and the great French writers of the 18th century, as well as his German contemporary, the poet Klopstock. All of these sources had great influence upon his own later work. In 1752 he published "The Nature of Things" under an assumed name. He lived in Switzerland (1752-60) and, after completing his college work, settled as senator and director of the chancery at Biberach (1760). In 1769 he became professor of philosophy in the Univ. of Erfurt, where he taught successfully until 1772, when he went to Weimar as tutor to the young duke Charles Augustus. While there he contributed to a number of periodicals, wrote many of his romances and poems.

Wieland ranks among the eminent authors of Germany. His writings are characterized by grace and harmony of expression and versification. "Oberon" is considered his greatest poem. Other writings include: "History of Agathon," "Impeachment of Love," "History of the Abderites," "Gods and Heroes," "Choice of Hercules," "Moral Tales," "Comical Stories," "Aristippus and Several of His Associates," and "Trial of Abraham's Faith." He published a monthly periodical called the *German Mercury* (1773-89) and made translations from Shakespeare, Horace, and Cicero. In Wieland's writing, gay sensuousness alternates with pious Christian devotion, but there is no doubt that the lighter side of his work is the more important one. His true importance, however, lies in the fact that his warm personality made him the center of German classical literature, the representatives of which then gathered in Weimar. Goethe and Schiller are only the best known of his friends; actually, in the era around

1800 there was hardly one German writer who had not been in contact with Wieland.

Wieland (*vē'länt*), HEINRICH, chemist, born in Pforzheim, Germany, June 4, 1877; died in Munich, Aug. 5, 1957. Graduated from the Univ. of Munich in 1901, he later lectured there and then served at the Inst. of Technology in Munich (1917-21) and at the Univ. of Freiburg (1921-25). He was director of the chemical laboratories at the Univ. of Munich from 1925 to 1952. In 1927 he won the Nobel Prize for chemistry for his investigations of the constitution of the bile acids and kindred substances.

Wieniawski (*vyĕ-nyäf'sḳē*), HENRI, violinist and composer, born at Lublin, Poland, in 1835; died in 1880. He showed marked musical talent as a child, entered the Paris Conservatory at eight, and when only 11 won the first prize in violin. He toured Poland and Russia as a child prodigy, returning to Paris to resume his studies. After extensive tours through Europe, he was named solo violinist to the Emperor of Russia in 1860, staying in that post until 1872, and living at St. Petersburg. The next two years were spent in the U.S., where he appeared in various cities with Anton Rubinstein. After a brief period as professor of violin at the Brussels Conservatory, he again went on tour, but his health failed. He died at Moscow. A great virtuoso, famed for his purity of tone and boldness of execution, he was also known—and sometimes criticized—for his occasional exaggeration and impetuosity. His compositions, consisting only of two concertos and several fantasias and drawing-room pieces, were not highly esteemed by other artists, but were popular. The most frequently heard are "Polonaise," "Souvenir de Moscou," "Le Carnaval Russe," "Légende," and "Fantasie on Gounod's 'Faust.'"

JOSEF AND HENRI WIENIAWSKI

Joseph Wieniawsḳi (1837-1912), brother of Henri Wieniawski, was a distinguished pianist, who appeared frequently with the violinist in concerts, taught music at the conservatories of Moscow and Brussels, and also wrote several chamber music and piano compositions.

Wien (*vēn*), WILHELM, physicist, born in Gaffken, East Prussia, Jan. 13, 1864; died Aug. 31, 1928. Wien's experiments centered on the laws of heat radiation and the measurement of high and low temperatures. This work developed into his pioneer research on cathodes and canal rays. In 1896, he published his formula, which became known as Wien's Law, representing the spectral distribution of thermal radiation from a black body. His work in this field won for him the Nobel Prize for physics in 1911.

Wiesbaden (*vēs'bäd-ẹn*), a city of Germany, in the province of Hesse-Nassau, 26 m. w. of Frankfort-on-the-Main. It is situated 2 m. from the Rhine, at the foot of Mt. Taunus, and has excellent railroad facilities. Before World War II, the city was the most fashionable and popular watering place in Germany, receiving many thousands of visitors annually. It has many beautiful buildings. In the vicinity are numerous saline springs, some cold and others warm. The Kochbrunn is the most remarkable, having a temperature of 156° F. The Romans were acquainted with the springs of Wiesbaden and near the place are remains of baths, walls, and a military station of Roman construction. The city is supported quite largely by summer visitors, but has manufacturing interests and a considerable trade in produce and merchandise. It was captured by the U.S. Third Army in March 1945, during World War II, and was later included in the U.S. zone of occupation. The Franco-German armistice commission met there (1940-44). Pop., *ca.* 172,500.

Wig (*wĭg*). See *Hair Dressing.*

Wigan (*wĭg'ạn*), an industrial and market town, municipal county and parliamentary borough of Lancashire, England, 18 m. N.W. of Liverpool. It lies on the small river Douglas, is served by the London, Midland & Scottish and the London & North Eastern R.R.'s, and is connected by canal with the ports of Liverpool, Manchester, and Preston. Present industries include cotton and woolen goods, food processing, brewing, chemicals, hardware, tools, machinery, and railway cars and engines. Historically, Wigan is the oldest borough in Lancashire; the charter was granted in 1246, and legend assigns the town's origin to a Roman camp. The chief buildings include the old boys' Grammar School, All Saints' Church, the Albert Edward Infirmary and Dispensary, the Wigan and District Mining and Technical Coll., and the Pemberton Carnegie Library. Mesnes Park, of about 20 acres, is the chief place of recreation. Population, *ca.* 78,000.

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WESTERN TIP OF THE ISLE OF WIGHT

Wiggin (*wĭg′ĭn*), KATE DOUGLAS. See *Riggs, Kate Douglas Wiggin.*

Wiggins (*wĭg′ĭnz*) (JOHN) CARLETON, artist, known through his career as Carleton Wiggins, born at Turners, N.Y., in 1848; died in 1932. He was educated at public schools in Brooklyn, N.Y., and studied art at the National Acad. of Design, in New York City. He first exhibited at the National Acad. in 1870. Except for the year 1880-81 spent in France, he worked in his New York studio, going to Old Lyme, Conn., each summer. In 1892 he was elected an associate member of the National Acad., and in 1906 a full academician. He specialized in landscapes, particularly rural scenes in which cattle were depicted. Besides exhibiting at home he also showed his work at the Paris Salon and the Royal Acad., London. Among his best-known paintings are: "A Young Holstein Bull," in the Metropolitan Museum, New York City; "Evening After a Shower" and "The Pasture Lot," in the National Gallery, Washington, D.C.; "October," in the Corcoran Gallery, Washington, D.C.; "Lake and Mountains," in the Chicago Art Institute; "Morning on the Hills," in the Brooklyn Museum; and "The Plow Horse," in the Lotos Club, New York City.

Wiggins, GUY CARLETON, artist son of (John) Carleton Wiggins (*q.v.*) and Mary Clucas Wiggins, born in Brooklyn, N.Y., in 1883. He studied painting under his father and at the Polytechnic institute, Brooklyn, and the National Acad. of Design. A landscape painter like his father, his best known canvases were those of city scenes. He was named a National Academician in 1935. His works include: "Metropolitan Tower," in the Metropolitan Museum, New York City; "Berkshire Hills, June," in the Brooklyn Museum; and "Columbus Circle, Winter," in the National Gallery, Washington, D.C.

Wight (*wīt*), ISLE OF, an island in the English Channel, off the south coast of England, part of the county of Hampshire, and separated from the mainland by the Solent and the Spithead. It measures 22 m. from east to west, 13 m. miles from north to south, and has an area of 147 sq. m. The chief rivers are the two Yars and the Medina. The island is chiefly renowned for its scenery and interesting geology, as in the colored sands of Alum Bay, and the 100-ft.-high cliffs at the western extremity cut by the sea to the jagged points known as the Needles. Such industries as the island has—cement works, yacht repairing and building, and such agricultural pursuits as sheep grazing and market-gardening—are entirely secondary to the large tourist trade. The various resorts ring the shore, including Yarmouth, Freshwater, Ventnor, Sandown, Bembridge, Ryde, and Cowes, but the chief town, Newport, lies near the center at the junction of the island's railways and roads. The climate on the south shore, because of the geologically freakish landslide known as the Undercliff, is particularly mild, and several large hospitals and nursing homes take full advantage of the clemency. The main event each summer is Cowes Week, the great international social meeting of yachts and yachtsmen. The island boasts that stones from its quarries were used in Winchester Cathedral. There is the interesting ruin of Carisbrooke Castle where Charles I was imprisoned. Osborne House, the favorite residence of Queen Victoria, is near Cowes. Near the western point is Farringford House, once the home of the poet Tennyson. Population, *ca.* 90,000.

Wigwag (*wĭg′wăg*), the act or art of communicating by moving flags or portable lights to and fro. Each position in which the flags are held symbolizes a part of the code used by the signalmen. Wigwagging at one time was an essential form of communication in the army and navy, but more modern methods of transmitting messages have almost entirely replaced it. See also *Morse, Samuel; Semaphore; Signals.*

Wigwam (*wĭg′wŏm*), a house built by the Indians of North America, especially one made of bark or matting in the form of a hut or cabin. Such a structure is built with a framework of saplings or small trees, which are set in the ground and converge at the top, where an opening is left for the escape of the smoke. Some tribes covered the framework with skins, while others used bark or braided mats of grass. In winter a fire was built in the center of the tent and mats were laid near the walls to serve as places to rest and sleep.

In political phraseology the expression "The Wigwam" is often used to refer to the Tammany Society (*q.v.*).

Wilberforce (*wĭl′bẽr-fōrs*), SAMUEL, clergyman, born at Clapham, England, Sept. 7, 1805; died July 19, 1873. He was a son of William Wilberforce, studied at Oriel Coll., Oxford, and in 1826 took orders in the Church of England. For some years he served as a rector on the Isle of Wight, and later preached before the Univ. of Oxford. In 1845 he was made Bishop of Oxford and became lord high almoner to the queen. Although an opponent of ritualism, he was a leader of the High Church party. His versatility in giving opinions caused him to be called *Soapy Sam.* Among his books are: "Heroes of Hebrew History," "Note-Book of a Country Clergyman," "A History of the Protestant Episcopal Church in America," "Agathos and Other Sunday Stories," "Poems," and "A Reproof of the American Church."

Wilberforce, WILLIAM, philanthropist, born in Hull, England, Aug. 24, 1759; died July 29, 1833. He was educated at Cambridge Univ., where he excelled as a student, and in 1780 he became a member of Parliament. In 1783 he joined Pitt in making a tour of France, where he studied the public institutions, and in 1784 was re-elected to Parliament for Yorkshire. While at Nice in the same year he was converted to the evangelical faith, after which he became devoted to the leading social and governmental reforms. About the same time he formed the acquaintance of Thomas Clarkson and joined him in the agitation against the slave trade. He advocated a law against permitting the further importation of African slaves into British colonies, which was finally adopted in 1807, and then began the agitation in favor of the total abolition of slavery. He was elected a vice president of the Anti-Slavery Society, formed in 1823, but did not live to see the fruition of his work, for the Emancipation Bill was not passed until shortly after his death. Wilberforce was not only active as an advocate of the liberation of slaves, but promoted many social and religious reforms. He was buried in Westminster Abbey, where a monument was erected in his honor.

Wilcox (*wĭl′ḳŏḳs*), ELLA WHEELER, author, born in Johnstown Center, Wis., in 1855; died Oct. 30, 1919. She attended the public schools of Windsor and afterward studied at the Univ. of Wisconsin. In 1884 she was married to Robert M. Wilcox, of Meriden, Conn., and three years later moved to New York City. She became a frequent contributor to magazines and other periodicals while she was at the university. In 1872 she published her first volume of poems under the title "Drops of Water." In addition to her writing she became a leading figure as a speaker and an advocate of woman's rights. Many of her short essays and criticisms were published in the New York *Journal,* the Chicago *American,* and others of the Hearst newspapers. Among her best known writings are: "Poems of Pleasure," "A Double Life," and "An Erring Woman's Love."

Wild Cat (*wīld ḳăt*), or CATAMOUNT, the general name given to several species of wild animals. The common wild cat of Europe formerly inhabited all parts of the continent, except the sections of the extreme north, and is still found in some of the forests and mountains. It is larger than the domestic cat and has a shorter and thicker tail. The limbs and body are longer and larger. The name wild cat is also applied to the jungle cat of India, the chati or margay of Mexico, and the lynx of North America.

Wilde (*wīld*), OSCAR FINGAL O'FLAHERTIE WILLS, author, born in Dublin, Ireland, Oct. 16, 1854; died in Paris, Nov. 30, 1900. He studied at Trinity Coll., Dublin, and Magdalen Coll., Oxford, where he took the Newdigate Prize for his poem, "Ravenna." It was at Oxford that he first adopted the aesthetic pose that served perhaps even more than his writings to make him famous. He affected velvet breeches and jacket, a flowing necktie and long hair, and always carried a single flower. It was this figure that W.S. Gilbert used as the model for the effeminate poet Bunthorne in his operetta "Patience." In 1879 Wilde went to London, where he won, almost overnight, a reputation as a wit and an aesthete, a disciple of Whistler's new "art for art's sake" doctrine. In 1882, he lectured in the U.S., and his drama "Vera" was produced in New York during his visit. In 1895 he was sentenced to two years in prison for offenses under the Criminal Law Amendment Act, the case against him having arisen from facts about his sexual inversion brought out in a libel suit which he himself had brought against the Marquis of Queensberry. In

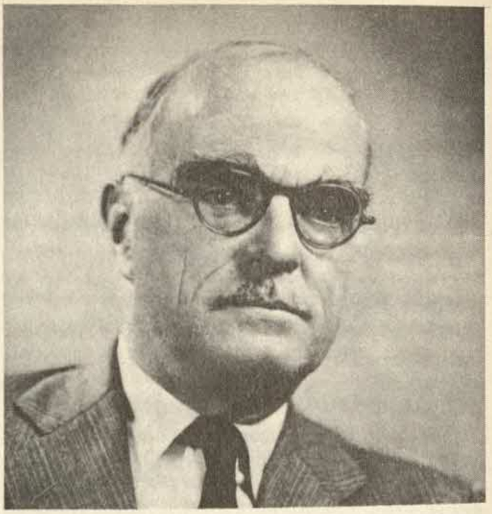
OSCAR WILDE

prison he wrote his apologia *"De Profundis,"* which was published in 1905, and began "The Ballad of Reading Gaol," published 1898. On his release he went to France, where he lived and wrote under the name Sebastian Melmoth.

A master of the epigram, he wrote many stage comedies of piercing wit. His poetry is melodious and shows much beauty of thought, and his fairy tales are charming. Perhaps the best summary of his work, however, is contained in his own famous epigram about himself: "... I have put my genius into my life—I have put only my talent into my works."

Wilde's plays include "The Duchess of Padua" (1883), "Lady Windermere's Fan" (1892), "Salomé" (in French, 1893; Eng. trans., 1894), "A Woman of No Importance" (1893), "The Importance of Being Earnest" (1895), and "An Ideal Husband" (1895). Among other works are "The Picture of Dorian Gray" (1891), his only novel; "Intentions" (1891), critical reviews and essays; "Lord Arthur Savile's Crime and Other Stories" (1891); the fairy-tale collections "The Happy Prince and Other Tales" (1888) and "A House of Pomegranates" (1891); and several volumes of poetry.

Wilder (*wīl′dẽr*), THORNTON NIVEN, author, born in Madison, Wis., April 17, 1897. Reared in China and the U.S., he attended Oberlin Coll., was graduated (1920) from Yale, and studied (1920-21) at the American Acad. in Rome, Italy. While a teacher at Lawrenceville (N.J.) School (1921-28), he received an M.A. from Princeton (1925) and produced two novels, "The Cabala" (1925) and "The Bridge of San Luis Rey" (1927), the latter of which won a Pulitzer prize. He was on the faculty of the Univ. of Chicago in 1930-36. After 1935 most of his works were plays, two of which—"Our Town" (1938) and "The Skin of Our Teeth" (1942)—won Pulitzer prizes. Other plays include "The Merchant of Yonkers" (1939), rewritten as "The Matchmaker" (1954). Among his novels are "The Woman of Andros" (1930), "Heaven's My Destination" (1935), and "The Ides of March" (1948).



THORNTON WILDER

Wilderness (*wĭl′dẽr-nĕs*), BATTLES OF THE, the name of a series of battles in the Civil War of America, sometimes spoken of collectively as the Battle of the Wilderness. It is so named from the general character of the region in which the contests occurred, a section of country characterized by swamps and thickets of pine and scrub oak. Gen. Grant had an army of 120,000 men and was supported by Meade, Hancock, and Burnside, while the Confederates under Gen. Lee numbered about 80,000 men. The Federals crossed the Rapidan River on pontoons on the night of May 3, 1864, under the immediate command of Gen. Burnside, and took a position at the margin of the Wilderness.

Lee anticipated the movement undertaken by Grant and began the attack early in the morning of May 5. The Confederates fully understood the locality, thus placing the Federals at some disadvantage in the almost impenetrable forests, which made it necessary to confine the fighting to musketry at close range. Gen. Warren carried the brunt of the battle during the day, while the Confederates were led by Gen. Ewell, and the day ended with little advantage to either side. In the meantime Grant ordered Hancock to move upon the scene from Chancellorsville, while he engaged the Confederates under Gen. Hill in a drawn battle. Lee summoned Longstreet to reinforce Hill and by joint action attempted to force the Federals back across the Rapidan, but the hostilities ended on the approach of night. Neither side gained material advantage: the Confederates were unable to advance farther and the Federals failed to progress toward Richmond. The contest of two days in the Wilderness caused a loss of 11,400 men by the Confederates and 15,387 men by the Federals. A few days later occurred the Battle of Spottsylvania Court House.

Wildlife (*wīld′līf*), a term used in America to refer to conservation of desirable forms of animal, bird, and fish life, through government and state agencies, and through efforts of private groups organized for that purpose. As long ago as 1739, protection of wildlife in this country was inaugurated by the State of Massachusetts through appointment of local officers for preservation of deer. However, like most of the measures adopted in the next 250 years, this was merely a matter of trying to limit the numbers of game killed by individual hunters. The net result of these efforts —usually through local or state agencies—was negligible as compared with the almost continuous exploitation, neglect, and abuse of the nation's wildlife resources. Due largely to the tenacity of the life-force, only a comparatively few species, such as the great auk, the Labrador duck, and the passenger pigeon, have actually vanished, but many others had come dangerously near to the extermination point before they were rescued by the government's conservation program.

The chief Federal agency of this program at the present time is the Fish and Wildlife Service of the U.S. Department of the Interior. Established in 1940, through a merger of the much older Bureau of Fisheries and Bureau of Biological Survey, it was charged with the task of enlarging national wealth through a variety of activities. In general, these are centered around (1) increasing the stocks of fish and wildlife, (2) resisting depletion of our national wildlife resources, (3) enlarging knowledge about them, and (4) improving and extending the use of them. Estimates have placed a value of approximately $30,000,000 a year on these services. By development of the closed-area system of game preservation, it has been found possible to increase the quantities of waterfowl and other game to such a degree that the established type of restricted seasons and bag limits prescribed by game and fur laws can often be greatly simplified, and eventually some of the so-called "nuisance regulations" can be abolished. After almost 50 years of research by government agencies, the basic principle underlying the present conservation system was adopted, and implemented by a series of legislative measures for the establishment of adequate areas to be set aside and managed as wildlife reservoirs, producing surplus stocks which move outward from the protected lands to occupy adjacent regions. This service also gives assistance to the fish and game preservation or restoration projects of the various states, allotting funds to them on a cooperative basis for the purpose of acquiring and developing lands for wildlife sanctuaries, as well as making available to them the results of surveys and investigations into the problems of wildlife management.

Roused by the prospect of extermination of many valuable species of wildlife, a number of organizations have aided the conservation movement with private funds and specialized programs for research and education of the public. Among these are the New York Zoological Society, organized in 1895; the National Association of Audubon Societies (1902); and the Permanent Wildlife Protection Fund raised by the late Dr. Hornaday. Aided by migratory-bird treaties with Canada and Mexico, and by increasing public interest, the Fish and Wildlife Service has succeeded not only in arresting the depletion of this country's stocks of wildlife, but is also gradually building up a reserve of many species of fish, birds and other game. In addition to these activities, it is now engaged in a program to increase supplies of commercially valuable wildlife, such as rabbits (raised for meat and fur), Alaska fur seals, salmon, Alaska herring, haddock, flounders, Maine lobsters, and many other useful species. Studies in pest-control, artificial fish propagation, research in deep-freezing for preservation of fish and animal foods—all these projects and many more are on the agenda of the National Fish and Wildlife Service.

Wiley (*wĭl′ȳ*), HARVEY WASHINGTON, chemist, born at Kent, Ind., Oct. 18, 1844; died June 30, 1930. He became state chemist of Indiana in 1881, serving until 1883, and was long a professor at Purdue Univ. Later he taught at George Washington Univ. and was chief chemist of the U.S. Dept. of Agriculture. He was president of the American Chemical Society (1893-95) and was a leading authority on sugar and glucose. He published "Principles and Practices of Agricultural Chemistry."

Wilhelmina (*vĭl-hĕl-mē′nȧ*), HELENA PAULINA MARIA, of Orange-Nassau, former queen of The Netherlands, born at The Hague, Aug. 31, 1880; died Nov. 28, 1962, at Het Loo, her palace near Apeldoorn. The Salic Law, precluding female descendants from the throne, had been in force up to 1888, when William III obtained its annulment. Wilhelmina received a liberal education in the classics, music, and painting. After a secluded and strictly disciplined childhood she was enthroned in the Nieuwe Kerk, Amsterdam, on Sept. 6, 1898. She won the love of her people and the admiration of foreign governments. Queen Victoria of England noted in her diary that Wilhelmina was "intelligent, cute and had charming manners." In 1901 she married Duke Henry Vladimir Albert Ernest of Mecklenburg Schwerin, who died in 1934. When her country was occupied by the Germans, along with Belgium, in

Courtesy Netherlands Information Bureau, N. Y.

QUEEN WILHELMINA

1940 (during World War II), she went to England, where she established a government-in-exile. She returned to The Hague in July 1945, after the liberation of her country. Her return, unlike that of most European monarchs, was accompanied with little, if any, opposition from her people. In 1948 she abdicated in favor of her daughter Juliana.

Wilhelm Strasse (*vĭl′hĕlm shträs′ę*), a street in the center of Berlin, Germany, occupied by most of the offices and official residences of the high officers of the Reich, including the *Auswärtige Amt* (foreign office). Wilhelm Strasse thus came to symbolize German foreign policy.

Wilkes (*wĭlks*), CHARLES, naval officer, born in New York City, Apr. 3, 1798; died in Washington, D.C., Feb. 8, 1877. He entered the navy in 1816 and three years later was sent to the Mediterranean, where he continued in the service until ordered to the Pacific, in 1821. After serving continuously until 1830, he was appointed to take charge of a department in the depot of charts and instruments at Washington, where he made the first astronomical observations in the U.S. by means of fixed instruments. In 1838 he was appointed to command an exploring expedition to the Samoan Islands, in the Pacific, and while on this tour explored the Fiji group and discovered many islands in the Antarctic Ocean, also sailing along the Antarctic coast for many miles, establishing the land as a continent. He was made a captain in 1855 and in 1861 was given command of the U.S. steamer *San Jacinto*. While serving in that capacity he seized Mason and Slidell, who were sailing on the British mail steamer *Trent* as commissioners of the Confederate states to England and France, and took them as captives to Boston. Although he received the thanks of Congress, the government finally released the prisoners at the demand of the British government, this incident being known as the Trent Affair. He was promoted to the rank of commodore in 1862 and at the close of the war was placed on the retired list. He published "Theory of the Winds," "Western America," "Meteorology" and "Hydrography."

Wilkes, JOHN, lord mayor of London, born in London, England, Oct. 17, 1727; died Dec. 27, 1797. He studied at the Univ. of Leyden, in The Netherlands, and spent some time in travel on the continent. In 1757 he was elected to Parliament for Aylesbury and soon became a fighter against the government. He published a paper entitled the *North Briton,* in which he severely criticized a speech made by the king to Parliament; for this he was arrested and committed to the Tower. Some technicality caused the prosecution to fail, but he was expelled from the House of Commons in 1764 and soon withdrew to France. Four years later he returned to England and was again elected to parliament, but he was not permitted to serve, although the constituency of Middlesex elected him three times in succession. This gave rise to an extensive agitation known as *Wilkes and Liberty.* In 1770 he became an alderman of London. The following year he was elected sheriff of London, and became lord mayor in 1774. In the same year he was again elected to Parliament and permitted to serve. The long contest of Wilkes for a seat in that body established the precedent under which each constituency is accorded the right to choose its representative without interference of the Parliament.

Wilkes-Barre (*wĭlks′băr-ę*), a city in Pennsylvania, seat of Luzerne County, on the North Branch of the Susquehanna River, *ca.* 97 m. N.W. of Philadelphia. It is served by the Lehigh Valley, Pennsylvania, Jersey Central, and other railroads.

With an area of 6.9 sq. m., the city is located in the Wyoming Valley. Anthracite coal mining was for many years the major industry. As competition from other heating fuels reduced the demand for coal, the city sought to attract diversified industries, which now produce cigars, steel-wire products, blasting powders, textiles and apparel, paper and rubber products, furniture, locomotives, and machinery. The city is part of the Wilkes-Barre-Hazleton standard metropolitan area including all of Luzerne County (891 sq. m.; pop., 1950, 392,241), which in 1954 had a value added by manufacture of $156,328,000; the figure for the city alone was $64,667,000.

Wilkes-Barre's *ca.* 25 public elementary and secondary schools enroll *ca.* 9,000 pupils annually. Institutions of higher learning include Wilkes Coll. and Kings Coll. Among cultural facilities is the Wyoming Historical and Geological Society Museum.

Wilkes-Barre was settled in 1769 by Connecticut pioneers and named for John Wilkes (*q.v.*) and Isaac Barré (1726-1802), a British officer. The town was made the county seat in 1786, was incorporated as a borough in 1806, and became a city in 1871. Population, 1950, 76,826.

Wilkie (*wĭl′k̦ĭ*), SIR DAVID, painter, born in Cults, Scotland, Nov. 18, 1785; died at sea off Gibraltar, June 1, 1841. He entered the Trustees' Acad. at Edinburgh in 1799 to study art. His first notable painting is a subject picture entitled "Pitlessie Fair," which he completed in 1804. In 1805, he established a studio in London and soon after became a member of the Royal Acad. Many of his paintings have been reproduced. He was knighted in 1836. Steady work damaged his health, and he sought to restore it in 1840 by making a trip to Palestine and Egypt, but died on his return voyage. His best-known paintings include: "The Village Politicians," "Callisto and Diana," "Napoleon and Pius VII at Fontainebleau," and "Queen Victoria Presiding at Her First Council."

Wilkins (*wĭl′k̦ĭnz*), SIR GEORGE HUBERT, explorer, born at Mt. Bryan East, South Australia, Oct. 31, 1888; died in Framingham, Mass., Dec. 1, 1958. Trained as an explorer by Vilhjalmur Stefansson (*q.v.*) during the latter's arctic expedition of 1913, he made (1928) the first flight over polar regions from North America to Europe (a 2,100-m. trip from Point Barrow, Alaska, to Spitsbergen, Norway). In 1931 he made an unsuccessful effort to reach the North Pole in his submarine *Nautilus*. He also explored the antarctic—1920-21, 1921-22 (the famous Shackleton expedition), 1928, and 1933-39 (the four Ellsworth expeditions). Wilkins' writings include "Under the North Pole" (1931) and "Thoughts Through Space" (1942). At his death he was a consultant to the U.S. Army Quartermaster Corps. See also *Polar Exploration*.

Wilkinsburg (*wĭl′k̦ĭnz-bûrg*), a borough in Allegheny County, Pennsylvania, adjoining Pittsburgh on the E. It is served by local transit lines and the Pennsylvania R.R. The surrounding country produces large quantities of coal. It was formerly known as Nairville, and later as Rippeyville, but was given its present name about 1840 in honor of William Wilkins, Secretary of War under President Tyler. Wilkinsburg was incorporated in 1887. Population, 1950, 31,418.

Wilkinson (*wĭl′k̦ĭn-sŭn*), ELLEN CICELY, social reformer, born in Manchester, England, 1891; died in London Feb. 6, 1947. The daughter of a cotton-mill worker, she attended Manchester Univ. and was active in the labor movement at an early age, becoming national organizer of the National Union of Distributive and Allied Workers in 1915. She was a member of Parliament, 1924-31, and from 1935 until her death, and with the formation of the Labour cabinet (1945) she became the second woman member of a British cabinet, assuming the post of minister of education. She was an ardent fighter for woman's suffrage; in 1926 she toured the U.S. raising funds for striking British miners; in 1936 she led 200 unemployed workers in a 300-m. hunger march to London.

Wilkinson, JAMES, soldier, born at Benedict, Md., in 1757; died Dec. 28, 1825. He studied medicine, but entered the Continental Army in 1778 and served in Canada and at Saratoga under Gates. His implication in the Conway Cabal caused him to resign from the service. After the close of the war he went to Kentucky, where he became implicated in an attempt to transfer that region from the U.S. to Spain. In 1791 he was reinstated in the army for service against the Indians, and five years later succeeded Gen. Wayne as commander-in-chief. President Jefferson appointed him governor of Louisiana in 1805 and the following year he disclosed the scheme of Aaron Burr to found an empire in the Southwest. Although implicated in the conspiracy, he was acquitted after being court-martialed. In the War of 1812 he co-operated with Gen. Hampton, but was discharged from the service on account of inability. Soon after he moved to Mexico, where he lived until his death.

Will (*wĭl*), in law, the disposition of a person's property to take effect after death. The term will is more strictly applied to the disposal of real property, while the word *testament* has reference to the disposition of personal property. The words *last will* are usually employed in documents that dispose of real property, while the expression *last will and testament* refers to the disposal of both real and personal property. In order to have testamentary capacity, that is, to be able to dispose of property either by a will or a testament, it is necessary that the person be of full age and sound mind. In most countries this right is vested in women who have reached their majority and in married persons of both sexes, even if they have not reached full age. A will must be in writing, be signed by the testator or someone acting in his presence and by his direction, and be witnessed by two persons who are present at the time and not beneficiaries under the will. The testator may name one or more persons as executors to see that the provisions of the will are carried out, but in the absence of such an appointment the court names the executor.

A *codicil* is an addition to the will. Both the will itself and one or more codicils, to render them inoperative, may be canceled or destroyed by the testator, or a document to revoke the will may be duly executed in the presence of two witnesses, who must sign it. If several wills are in existence, the one of latest date takes precedence, but, if it is revoked, the former one is thereby revived. The custodian of a will files it in the probate court after the death of the testator, where it is admitted to probate and is afterward duly recorded. In most countries personal property can be disposed of by will verbally in the presence of witnesses, though the value is usually limited to $300.

Will, means a succession of mental acts which ends in a decision to do something or in a choice between two or more possible actions. In order to achieve this, the first action is the attempt to recognize the alternative courses of doing which would lead to certain goals. The second stage is a contemplation and comparison of the various possibilities and the scrutinizing of the final values resulting from a completed action. The final act consists of the translation of the theoretical judgment into final action. In contrast to the *will,* the mere *wish* does not contemplate whether the wanted goal can be achieved at all. If the result of such a contemplation is negative, no act of will would be motivated; the wish, however, would persist. The object of will is the *purpose;* what one does to attain it, are the *means.* Thus if one wills a purpose, one wills also the means. If, however, these means are impossible for technical or moral reasons, one must change one's will. This judgment is exercised by reason, either by practical or theoretical reason. This process is called the freedom of will or the dominance of reason over the will.

Whether this process exists or not is one of the main problems of all philosophy and even of theology (see *Determinism*). On the one hand are those who maintain a theological and metaphysical belief in the freedom of the will, while others assert that will action is the result of necessity. Aristotle asserted the freedom of the will in his ethics and was supported in that view by the Stoics, the Epicureans, Origen, and St. Augustine. For the Scholastics (*q.v.*), the problem of will was foremost. The possession of will was to them characteristic for man only, since animals are driven to action by physical needs and desires, and thus follow simply the ~~law~~ of nature. Man, however, has a free will to determine his line of action. Transcendental goodness will move man to will only the right and good; if not, man has lost his connection with God, as interpreted by the Scholastics. Many modern writers, among them Kant and Hamilton, have supported the view that the action of the will is unrestrained. The Gnostics denied the freedom of the will, as also did many early Christians, Spinoza, and Hume. The direction of the will is to a high degree dependent on the conditioning surroundings, habit and tradition, but also on the imagination and emotion of the individual. The psychology of will must consider all these factors equally.

Willaert (*wĭl'ârt*), ADRIAN, Flemish musician, born in Flanders, probably at Bruges, *ca.* 1480; died *ca.* 1562. He spent little of his life in his native country. Going to Paris to study law, he turned instead to music and studied theory. His first known compositions were written in 1518. After living in Italy for several years he was appointed cantor to King Ludwig of Bohemia and Hungary. His prominence as a composer, conductor of choral music and teacher was attained after he went to Venice in 1527, to assume the position of *maestro di cappella* of St. Mark's. Except for two brief visits to his birthplace, he spent the rest of his life in Venice, where he founded a school of singing from which many distinguished musicians emerged. His is one of the names associated with the peak of Flemish culture in the 15th and 16th centuries. A prolific composer, he wrote five masses, numerous collections of motets and of madrigals, and various hymns, all published in Venice. Other works of his were published in Antwerp and elsewhere. He was the first to make use of double choruses. His motets for from four to six voices were precursors of the oratorio, a form of dramatic recitative not developed until later. Most admired in modern times have been his madrigals and a magnificat for three choirs.

Willamette (*wĭ-lăm'ĕt*), a river in Oregon, which rises in the Calapooia Mts., a range of the Cascades, and after a general course toward the north enters the Columbia near Portland. It has a total length of 258 m. and is navigable for 150 m. A canal and locks are maintained to avoid the falls at Oregon City and Eugene. The Willamette valley is the most densely populated part of Oregon. Among the chief tributaries of the Willamette are the Yamhill, Santiam, Calapooia, and McKinzie Rivers. Portland, Salem, Albany, Oregon City, and Eugene are the principal towns on the Willamette.

Willard (*wĭl'ẽrd*), EMMA HART, educator, born at Berlin, Conn., Feb. 23, 1787; died Apr. 15, 1870. She studied at the academy in her native village, and became a teacher in the public schools. ~~Three~~ years later she was chosen principal of an academy for girls at ~~Middlebury~~, Vt., where she married Dr. John Willard in 1809. She established a boarding school for girls and made it an instrument to promote higher education among women. In 1821 the school was moved to Troy, N.Y., where it was incorporated as the Troy Female Sem. Later she aided in founding a school for girls at Athens, Greece. Her books include: "History of U.S.," "Willard Geographies and Atlases," and "Last Leaves of American History." She is also the author of the poem, "Rocked in the Cradle of the Deep."

Willard, FRANCES ELIZABETH, lecturer and reformer, born in Churchville, N.Y., Sept. 28, 1839; died in New York City, Feb. 18, 1898. She was graduated from the Northwestern Female Coll., Evanston, Ill., in 1859. After teaching for several years and spending two years in Europe and the East, she was named president of the Evanston Coll. for Ladies in 1871, serving in that capacity until 1874. There she first showed her extraordinary ability as an organizer and leader. In 1874, the year in which she joined the temperance movement, she was chosen president of the Chicago Woman's Christian Temperance Union and from then until her death she was affiliated with the organization, becoming president of the National W.C.T.U. in 1879 and of the World's W.C.T.U. in 1891. In 1882 she helped to organize the Prohibition party. In 1892 she became editor of the *Union Signal,* the official organ of the Union, and continued to edit it until her death.

Miss Willard early became known as an effective speaker and for many years her energy seemed to be almost boundless. For 10 years she averaged one address daily before a public meeting and spoke in nearly every city of 10,000 or more inhabitants in the U.S. In 1905 a statue in her honor was placed in the Capitol at Washington.

FRANCES E. WILLARD

Her writings include: "Glimpses of 50 Years," "Woman and Temperance," "How to Win," "Nineteen Beautiful Years," and "A Great Mother."

William (*wĭl'yạm*), Prince of Orange, founder of the Dutch Republic, surnamed *The Silent,* born at the palace of Dillenburg, in Nassau, Apr. 16, 1533; assassinated in Delft, July 10, 1584. He was the eldest son of William, Count of Nassau, who was a zealous Lutheran. In 1538 he became a page at the court of Charles V, and his many talents made him a favorite of the king.

In 1555, Charles V transferred The Netherlands to his son, Philip II of Spain. Philip's reckless persection of the Protestants, culminating in his sending the crued Duke of Alva to put down opposition to his methods, caused William to turn against him and to join the cause of the Protestants, although he had been brought up a Catholic. In 1567, he retired to Germany, but returned to The Netherlands the following year and made an unsuccessful attempt to expel the duke. He was forced to retire to French Flanders, where he joined the Huguenots under Coligny. In 1572, he again tried to defeat the duke, but the St. Bartholomew's Day massacre checked his hopes of obtaining material aid from France and he was forced to disband his army because of lack of funds.

Meanwhile, however, a large number of Dutch privateers had been harassing the coast, and several towns in Holland and Zeeland, two provinces in the northwest part of The Netherlands, had taken courage and rebelled against the occupying Spaniards. In 1572, Holland and Zeeland made William their stadtholder and until 1576 the two provinces resisted the Spaniards alone. The siege of Leyden (1574) was one of the important events of that period. The city had been surrounded by the Spaniards until it was almost starved into surrendering, but William saved it by breaking the dikes and letting in the sea to destroy the Spaniards' fortification. Finally, after the death of the successor of Alva, William was instrumental in forming the pacification of Ghent which the greater part of the Low Country signed and which called for the expulsion of the Spaniards. In 1579, however, the southern provinces were restored to the king. Therefore, William unified the northern provinces of Holland—Utrecht, Friesland, Zeeland, and Gelderland—in the Union of Utrecht (1579). This was the foundation of the republic of the United Netherlands, and William was named its first stadtholder. Philip II set a price of 25,000 gold crowns upon William's head, and the latter was finally assassinated by a Frenchman named Balthasar Gérard.

William I, surnamed *The Conqueror,* King of England and Duke of Normandy, born at Falaise, Normandy, in 1027; died near Rouen, France, Sept. 9, 1087. His father, Duke Robert I of Normandy, died in 1035 and several claimants contested the throne, but his guardians were able to maintain his rights until he reached manhood. Edward the Confessor, King of England, was his second cousin and the Norman influence

WILLIAM I

at the English court had gained considerable strength during his reign. At the death of the latter, William claimed the throne of England, but the English objected to his pretensions and chose Harold, a Saxon, as king. William thereupon invaded England with a powerful army from Normandy and at the Battle of Hastings, on Oct. 14, 1066, totally defeated the English under King Harold, who was slain in battle. His government was mild and considerate at first, but the conquered Saxons rose in open revolt in 1070 to expel the Normans and, after subduing the revolt, he treated them thenceforth as a conquered nation.

William established the feudal system by granting large tracts of land to his nobles, garrisoned the fortresses with Normans, and insisted upon firm administration of law and justice. He invaded Scotland with a large army in 1072, and Malcolm Canmore, King of Scotland, was required to recognize Norman authority. In the later part of his reign he authorized a general survey of the lands and had records made of the various divisions, which are still found in the *Domesday Book*. In 1080 his son, Robert, commanded an army in an open war against him. William invaded France in 1087 because the King of France had encouraged Norman nobles to start a rebellion. While in France he left his half-brother, Bishop Odo, to administer the government in England. The army under William the Conqueror captured Nantes and several other points, but he was injured by falling from a horse and died in the abbey of St. Gervais, near Rouen.

William II, surnamed *Rufus,* King of England, born in Normandy in 1056; died Aug. 2, 1100. He was the second son of William the Conqueror, whom he succeeded as King of England on Sept. 26, 1087. His elder brother, Robert, had rightly inherited the throne, but William hastened to England on hearing of the death of his father and was crowned at Westminster. His brother, then Duke of Normandy, was supported for the throne of England by the Norman barons and accordingly incited an insurrection, but William promptly invaded Normandy. After obtaining recognition as King of England, he expelled the disaffected Norman barons and confiscated their estates. Subsequently he invaded Scotland, put down insurrections in Wales, and made numerous internal improvements. He completed the Tower, erected Westminster Hall, and built the London Bridge. In 1091 he crossed into Normandy with an army, but made a conciliation with his brother, Robert, in 1096 by lending him $50,000 so that he might join the Crusade to the Holy Land. As security for this loan he accepted a mortgage on Normandy. William was shot, whether accidentally or not has never been proved, while hunting in the New Forest by Sir Walter Tyrrel. He was succeeded by his younger brother as Henry I.

William III, Stadtholder of Holland and King of England, born at The Hague, Nov. 1, 1650; died in Kensington, Mar. 8, 1702. He was a son of William II of Nassau, Prince of Orange, and Mary, daughter of Charles I of England. William's rightful claim to the office of stadtholder met some opposition, and the government of the United Provinces was in the hands of John De Witt for some years. France and England declared war against The Netherlands in 1672, when De Witt was murdered in an open revolt, and William was declared captain general and stadtholder of the United Provinces. When almost overpowered by the larger opposing army, William cut the dikes built by the Hollanders to prevent the sea from flooding their lands, thus compelling the allied armies to retire. The Treaty of Nimeguen finally restored peace in 1678, when Louis XIV of France withdrew his hostile forces. William had married Mary, daughter of King James II of England, in 1677, and thus was in a position to exercise considerable influence. He curbed the power of Louis XIV by stimulating the League of Augsburg, in 1686, and on Nov. 5, 1688, invaded England with a powerful army at the invitation of many leading citizens.

The people rallied to his support as soon as he reached the shore at Torbay, while James fled with his family to France, and William and Mary were proclaimed joint sovereigns on Feb. 13, 1689. Scotland almost immediately accepted the new conditions, but Ireland, with an army under James, supported the cause of the deposed king. However, their forces met defeat at Boyne in 1690 and at Aughrim in 1691, and they were finally compelled to submit. William next invaded France to punish Louis XIV, who had been championing the cause of James, but his army

Courtesy British Information Services, N. Y.

WILLIAM III

Painting by William Wissing (1656-1687)

was defeated in a number of decisive battles and he was compelled to accept the Treaty of Ryswick, in 1697. Louis XIV recognized William as King of England on the death of James, in 1701. William is classed among the ablest kings of England. Within the period of his reign much progress was made in the educational and industrial welfare of the people. He died as a result of falling from his horse at the time when the War of the Spanish Sucession was about to begin.

William IV, King of England and Ireland, born in London, Aug. 21, 1765; died June 20, 1837. He was the third son of George III, became a midshipman under Adm. Digby in 1779, and was made Duke of Clarence in 1789. On the death of the Duke of York, in 1827, he became heir apparent, and on June 26, 1830, succeeded his brother, George IV, on the throne. The events of his reign include the abolition of slavery in the colonies, the passage of the Reform Act, the reform of the poor laws, and extensive internal improvements. William married Adelaide of Saxe-Meiningen in 1818, but left no surviving children. He was succeeded by his niece, Victoria, who was the daughter of Edward, Duke of Kent, fourth son of George III.

William I, King of Prussia and Emperor of Germany, born in Berlin, Mar. 22, 1797; died Mar. 9, 1888. He was the second son of Frederick William III of Prussia. In 1813, he attained the rank of captain and accompanied Blücher in his campaigns against Napoleon (1813-15). He was made major general in 1818 and studied the military systems of several European countries. In 1829 he married Princess Augusta of Saxe-Weimar. William commanded the forces that suppressed the revolution of 1848. In 1858 he became regent, owing to the illness of his brother, King Frederick William IV, and on Jan. 2, 1861, succeeded the latter on the throne of Prussia. He won great popularity for his success in cementing the bonds between the German states.

In 1864, William added the duchies of Schleswig and Holstein to Prussia by a successful war against Denmark, and in 1866 his military forces subdued those of Austria, ending in the famous victory of Sadowa. When Napoleon III declared war against Prussia, in 1870, the German states rallied to his standard. At the Battles of Sedan and Gravelotte he had personal command, and afterward entered Paris at the head of the army. On Jan. 18, 1871, he was proclaimed Emperor of Germany in the palace of Versailles. His reign of 31 years witnessed the unification of the German states and the emergence of Germany as a world power. Von Moltke was a great soldier of his reign and Bismarck the ranking statesman. He was succeeded by his son, Frederick III.

William II, King of Prussia and Emperor of Germany, eldest son of Emperor Frederick III, born in Berlin, Jan. 27, 1859; died June 4, 1941. After studying under private tutors at home and at the gymnasium of Cassel, in 1877, he became a student in the Univ. of Bonn. He married Princess Augusta Victoria of Schleswig-Holstein (died 1921), Feb. 27, 1881, and on June 15, 1888, succeeded his father as emperor. His determination to be ruler in fact as well as in name caused Prince Bismarck to resign as chancellor of the empire in 1890. Other events of importance during his reign include the acquisition of Helgoland, the extension of colonial interests in Africa and the Pacific, the establishment of the Triple Alliance, deliberate competition with England as a naval power, and legislation favorable to the laboring and agricultural classes. He demon-

WILLIAM II

strated keen interest in the dissemination of education, especially in the primary and elementary lines, and became noted as a patron of science. The policy pursued by his government materially increased the importance of Germany as a manufacturing and exporting country. The story of his reign before and during World War I is such that it can be considered the actual history of Germany during that period. At the end of the war he abdicated and withdrew to Holland. He remarried in 1922, marrying the widow Princess Hermine of Schönaich-Carolath (1887-1947). See also *Germany*.

William and Mary (*wĭl′ya̭m a̭nd mâr′y̆*), COLLEGE OF, a coeducational, state-controlled, institution of higher learning in Virginia. The main campus is at Williamsburg, and others are in Norfolk and Richmond. The second-oldest college in the U.S., it was granted a charter in 1693 by William and Mary of England and became a university in 1779. Phi Beta Kappa was founded here on Dec. 5, 1776. Major offerings are in liberal arts, and professional courses are offered in law, social work, and other fields. The library includes many rare books and manuscripts concerned with the history of Virginia. Annual student enrollment at all branches is *ca.* 6,000; the faculty at Williamsburg numbers *ca.* 150.

Williams (*wĭl′ya̭mz*), FRANKWOOD EARLE, psychiatrist, born at Cardington, O., in 1883; died in September 1936. The son of a physician, Dr. James Leander Williams, he studied at the Univ. of Wisconsin and took his medical degree at the Univ. of Michigan. His first post was as resident physician in the State Psychopathic Hospital of the Univ. of Michigan (1912-13). Executive officer and first assistant physician at the Boston Psychopathic Hospital (1913-15), medical director of the Massachusetts Society of Mental Hygiene (1915-17), chairman of that state's Advisory Prison Board (1916-17), he was medical director of the National Committee for Mental Hygiene (1917-31), and then took up private practice in New York City. In World War I, he was commissioned a major and became chief of the division of neurology and psychiatry in the Surgeon General's Office, Washington, D.C.

Distinguished as an authority on the problems of crime, juvenile delinquency, and education, he was chairman of a committee of experts which conducted (1924) a survey of prisons in New York, and showed that crime is related to disease, either mental or physical. He contended that the criminal should be treated as "abnormal" or "sick," rather than as "bad"; he urged the establishment of hospital-schools, instead of jails. He edited the quarterly publication *Mental Hygiene* (1917-31) and contributed to medical and scientific journals. Among his books were: "Adolescence—Studies in Mental Hygiene," "Youth and Russia," and "Social Aspects of Mental Hygiene." He also lectured at the Smith Coll. School for Social Work, at the New York School of Social Work, at the Yale Univ. School of Medicine, and at Columbia Univ.'s Coll. of Physicians and Surgeons. He died suddenly while at sea en route home from a trip to Europe, in September 1936.

Williams, (FREDERICK) BALLARD, artist, born in Brooklyn, N.Y., Oct. 21, 1871; died in Glen Ridge, N.J., Dec. 11, 1956. He studied art in New York City at the Cooper Union Art School and at the National Acad. of Design. His paintings of landscapes and figures were exhibited in many parts of the U.S. and in London, Paris, Venice, and Rome. His individualistic style of painting, with emphasis on richness of color and variety of texture, was considered representative of the transition from romanticism to impressionism in American art. He was for four terms president of the Salmagundi Club, New York City, and early in the 1930's served on the Mayor's Municipal Art Committee of 100 for New York. In 1943 he was awarded the Medal of Honor of the Salmagundi Club. He was long associated with the National Acad. of Design as a member of the council and as treasurer and was the founder (1927) and later national chairman of the Artists' Professional League. He continued at the same time to paint in his studio at Glen Ridge, N.J. He is represented by works in the Metropolitan Museum, New York City; the National Gallery, Washington, D.C.; and galleries in various other American cities.

Williams, JESSE LYNCH, author, born at Sterling, Ill., in 1871; died in 1929. He was graduated

JESSE LYNCH WILLIAMS

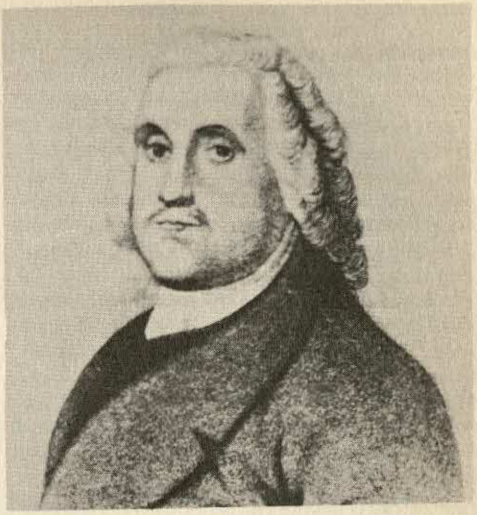
Courtesy Charles Scribner's Sons, N. Y.

from Princeton Univ. in 1892, and soon began publishing books related to his college life. The books include: "New York Sketches" (1902) and "The Married Life of the Frederick Carrolls" (1910). He turned to playwriting, for which he received greater acclaim than as a writer of stories. "The Stolen Story," first published as a short story in 1899, was the basis for one of his earliest plays. In 1917, his satirical comedy, "Why Marry?", was the first play to win the Pulitzer Prize. Another comedy, "Lovely Lady," written and produced in 1925, was the last of his Broadway plays.

Williams, JOHN, missionary, born at Tottenham, England, June 29, 1796; died in the New Hebrides, Nov. 20, 1839. The London Missionary Society sent him to the South Sea Islands in 1816, where he learned the native language and converted and educated the people. He visited many other islands and trained natives to do missionary work. While at Erromango, in the New Hebrides, he was assassinated by the natives.

Williams, JOHN SHARP, politician, born at Memphis, Tenn., July 30, 1854; died Sept. 28, 1932. He studied at the Univs. of Virginia and Heidelberg, Germany, and was admitted to the Tennessee bar in 1877. The following year he moved to Yazoo, Miss., where he built up a successful law practice. A frequent delegate to Democratic national conventions, he was active in the movement to nominate William Jennings Bryan (*q.v.*) in 1896. Williams served in the U.S. House of Representatives (1893-1909) and in the Senate (1911-23). He was Democratic (minority) leader in the House for many years. He wrote "The Permanent Influence of Thomas Jefferson on American Institutions" (1913).

Williams, ROGER, Puritan clergyman and founder of the colony of Rhode Island, born in London *ca.* 1604; died in Rhode Island *ca.* 1683. He was graduated from Cambridge Univ. and studied law, but later became a clergyman in the Anglican Church. He joined the Puritans and in 1631 came to Massachusetts, where he was pastor in Plymouth and Salem. His pronounced views in favor of religious toleration and separation of church and state caused him to be banished from the colony. In 1636 he left Salem and founded Providence, establishing friendly relations with the Indians. The settlement was so named in remembrance "of God's providence to him in distress." He was publicly immersed in 1639 and became pastor of what is generally thought of as the first Baptist church in America. Only a few months later, however, he became a "Seeker" or "Independent," espousing the basic tenets of Christianity but affiliating himself with no particular sect.



ROGER WILLIAMS

When Massachusetts began to claim jurisdiction over Narragansett Bay, Williams went to England (1643) and there obtained an independent charter. In 1651 he again visited England to win a more favorable charter and on returning to the colony in 1654 became its governor, serving in that office until 1657. Rhode Island (*q.v.*) was founded on the basis of complete separation of church and state and the absolute religious freedom enjoyed there was entirely due to Williams' efforts.

He published several books, including: "The Bloudy Tenent of Persecution for Cause of Conscience Discussed," "Experiments of Spiritual Life and Health," and "The Hireling Ministry None of Christ's."

Williams, SAMUEL WELLS, historian and lecturer, born in Utica, N.Y., Sept. 22, 1812; died in New Haven, Conn., Feb. 16, 1884. He was graduated from the Rensselaer Polytechnic Institute in 1832 and the following year went to China as a printer in the service of the American Board of Foreign Missions. For several years he assisted in editing the *Chinese Repository*. From 1853-54 he was interpreter to Commodore Perry on his expedition to open Japan to the trade of the world. In 1862 he became secretary and interpreter to the U.S. legation in China, but returned to the U.S. in 1875 to lecture on Chinese literature and language in Yale Univ. His writings include "History of the Middle Kingdom" and "Easy Lessons in Chinese." He translated the books of Matthew and Genesis into Japanese.

Williams, TENNESSEE (christened THOMAS LANIER), dramatist, born in Columbus, Miss., March 26, 1914. He received his A.B. degree from the Univ. of Iowa in 1938 and later traveled in the U.S. His "American Blues" (a collection of plays, 1939), won a Group Theatre Prize. Subsequently he received two Rockefeller Fellowships and, in 1943, an award from the Inst. of Arts and Letters. "The Battle of Angels"

(1940) closed before it was presented on Broadway, but "The Glass Menagerie," a sensitive study of domestic frustration in the South, appeared in 1944. After publishing a collection of one-act plays ("27 Wagons Full of Cotton," 1946), he wrote "A Streetcar Named Desire" (1947), which appeared on Broadway, as did "Summer and Smoke" (1948), "The Rose Tattoo" (1951), "Camino Real" (1953), "Cat on a Hot Tin Roof" (1955), "Orpheus Descending" (1957), and "Sweet Bird of Youth" (1959). Williams received Pulitzer Prizes for "A Streetcar Named Desire" (1948) and "Cat on a Hot Tin Roof" (1955); these plays and "The Glass Menagerie" also received New York Drama Critics' Circle awards. His first novel was "The Roman Spring of Mrs. Stone" (1950).

Although he has been criticized for occasional lapses into sentimental verbiage, there are few who deny his poetic and incisively accurate delineations of the American scene.

Williams, WILLIAM, painter, born in England, 1710; died in Bristol, England, 1790. Though little is known of his early life, it seems probable that he went to sea. About 1740 he was in Philadelphia, where he taught Benjamin West (*q.v.*) and painted scenery for the first Philadelphia theater. Later he went to New York City and probably returned to England about 1780. He died in a Bristol almshouse. A manuscript found in his possession, "The Journal of Llewellin Penrose, a Seaman," is thought to be in part autobiographical and was published in 1815. Williams' paintings are notable for their rich coloring and romantic subject matter.

Williams, WILLIAM, merchant and patriot, born in Lebanon, Conn., April 8, 1731; died there Aug. 2, 1811. He was graduated (1751) from Harvard Coll., fought in the French and Indian War, and established a business in Lebanon. He was a delegate (1776-78, 1783-84) to the Continental Congress, helped in drawing up the Articles of Confederation, and signed the Declaration of Independence. He served in the Connecticut legislature for nearly 50 years.

Williams, WILLIAM CARLOS, poet and pediatrician, born in Rutherford, N.J., Sept. 17, 1883; died there, March 4, 1963. After studying in New York City and Switzerland, he received (1906) an M.D. degree from the Univ. of Pennsylvania and established a practice in Rutherford, which he maintained until his retirement in 1952. His literary work includes some 40 volumes, notably "Paterson" (1946-58), a five-volume verse chronicle of an American city; "Complete Collected Poems, 1906-1938" (1939); "The Desert Music" (1954), and "Journey to Love" (1955). His prose works include "The Autobiography of William Carlos Williams" (1951), "Selected Essays" (1954); and "Yes, Mrs. Williams: A Personal Record of My Mother" (1959), as well as novels and short stories.

WILLIAMSBURG, VIRGINIA
Reconstruction of the governor's palace, originally built from 1706 to 1718

Williams, WILLIAM SHERLEY (OLD BILL WILLIAMS), trapper and trader, born in Rutherford County, N.C., 1787; killed in Indian territory, 1849. During much of his early life he was an itinerant preacher in Missouri. In 1822 he became an independent trapper and traveled widely on trapping and surveying missions in California, Texas, and the Yellowstone country. In 1848 he joined Col. J. C. Frémont's fourth expedition to find a feasible railroad route through the Rocky Mts. Frémont, against Williams' advice, led the party to the headwaters of the Rio Grande, where most of them died of cold and starvation. Williams was killed by Ute Indians while trying to retrace the route of the expedition.

Williamsburg (*wĭl′yạmz-bûrg*), an independent city in eastern Virginia, county seat of James City County, located between the James and York rivers, *ca.* 50 m. S.E. of Richmond, Va. It is served by the Chesapeake and Ohio R.R. Settled in 1632 as Middle Plantation, it supplanted Jamestown as capital of the Virginia colony in 1699, when it received its present name. Williamsburg was incorporated as a city in 1722, being the first incorporated municipality in Virginia. It was the political, social, and educational center of Virginia until 1779, when Richmond became the capital. During the Revolutionary War it was the headquarters, first of the British, then of Continental and French forces before and after the siege of Yorktown. In 1862 a rearguard action was fought here between retreating Confederates and a Federal force under Gen. G. B. McClellan. Williamsburg is the seat of the Coll. of William and Mary (*q.v.*), the second oldest institution of higher learning in the U.S.

A portion of the city has been restored to its 18th-century appearance in a project financed by John D. Rockefeller, Jr., which was begun in 1927 and which was virtually completed in 1958. Over 325 colonial residences and public buildings, gardens, streets, and greens were restored or reconstructed. Among the points of interest are the reconstructed governor's palace; the capitol building, a reconstruction on the original foundations; the rebuilt Raleigh Tavern; the Public Gaol, a colonial prison for debtors and criminals; the George Wythe House, George Washington's headquarters just prior to the siege of Yorktown; and Bruton Parish Church. Population, 1940, 3,942; in 1950, 6,735.

Williamsport (*wĭl'yąmz-pōrt*), county seat of Lycoming County, Pennsylvania, on the west branch of the Susquehanna River, 70 m. N.W. of Harrisburg. It is served by the Pennsylvania, Reading, and New York Central R.R.'s, and is surrounded by a rich farming and coal-producing region. Manufactures include steel rails, chemicals, cables, leather, furniture, and paper products. Lycoming Coll. is located here. Originally settled in 1772, the town was laid out in 1795 and incorporated as a city in 1866. Population, 1940, 44,355; in 1950, 45,047.

Williamstown (*wĭl'yąmz-toun*), a town and unincorporated village in Berkshire County, Massachusetts, *ca.* 20 m. N. of Pittsfield. It is served by the Boston and Maine R.R. The principal manufactures are film and wire products. It is the seat of Williams Coll., a liberal arts college for men, opened as a "Free School" in 1791, and chartered as a college in 1793. The faculty numbers about 150, and student enrollment is about 1,100. The Sterling and Francine Clark Art Inst. is located here. The town was settled in 1753 under the name of West Hoosac and incorporated in 1765 as Williamstown, named in honor of Ephraim Williams (1714-55). Population of the town, 1950, 6,194; of the village, 5,015.

William Tell (*wĭl'yąm tĕl*) or GUILLAUME TELL, hero and title of an opera by Gioacchino Rossini, based on Friedrich von Schiller's drama "William Tell." This last operatic work of the Italian composer was performed for the first time in Paris in 1829; the American *première* took place in New York City in 1845.

Willibrord (*wĭl'ĭ-brôrd*), SAINT, a missionary, "the apostle of the Frisians," who lived *ca.* 658-739. Born in England, in the kingdom of Northumbria, he settled (690) among the Frisians and established a mission there. In 696 he was consecrated as bishop by the Pope in Rome. Returning to Friesland, he founded his see at Utrecht and a monastery at Echternach. His feast day is Nov. 7.

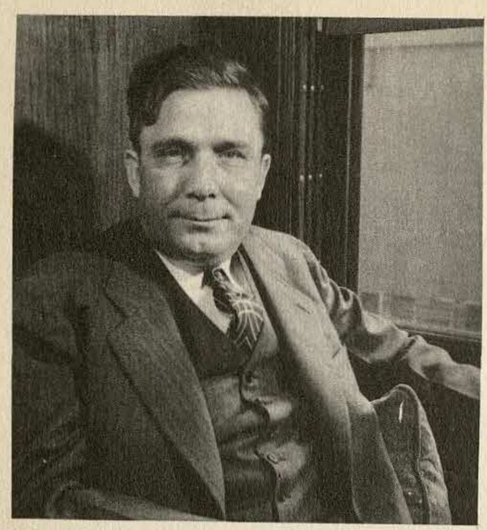
Willimantic (*wĭl-ĭ-măn'tĭk*), a city in eastern Connecticut, on the Willimantic River, 27 m. E. of Hartford. It is a county seat (with Putnam) of Windham County and is served by the New York, New Haven, & Hartford and the Central Vermont R.R.'s. The city's manufactures include cotton and silk textiles, rayon fabrics, linen thread, screws, machinery, and radio supplies. There is a state teachers college here. Willimantic was settled in 1822 and incorporated as a city in 1893. Population, 1940, 12,101; in 1950, 13,586.

Willing (*wĭl'ĭng*), THOMAS, banker and merchant, born in Philadelphia, Pa., Dec. 19, 1731; died there Jan. 19, 1821. After studying law in London, he joined his father's business in Philadelphia and, later, with Robert Morris (*q.v.*), founded an important trading firm. He served as mayor of Philadelphia (1763) and as justice of the Pennsylvania court (1767-77). A delegate (1775-76) to the Continental Congress, Willing voted against the Declaration of Independence, but raised large amounts of money for Gen. Washington's army during the Revolution. He was one of the founders and the first president (1781-92) of the Bank of North America. He was also the first president of the Bank of the United States, founded in 1791.

Willis (*wĭl'ĭs*), NATHANIEL PARKER, author and journalist, born in Portland, Me., Jan. 20, 1806; died at Idlewild-on-Hudson, near Newburgh, N.Y., Jan. 20, 1867. After graduation from Yale (1827), he founded and edited the *American Monthly Magazine* (1829) in Boston. When this magazine merged with the New York *Mirror,* Willis went abroad as correspondent for the *Mirror* and for English magazines. His numerous books, culled for the most part from his journalistic writings, include "Fugitive Poetry" (1829), "Pencillings by the Way" (3 vols., 1835), and "Loiterings of Travel" (3 vols., 1840). His play "Bianca Visconti," produced in New York (1837), won a prize.

Willis, THOMAS, physician and anatomist, born in Great Bedwin, Wiltshire, England, Jan. 27, 1621; died in London, Nov. 11, 1675. He became a professor of anatomy at Oxford Univ. (1660) and established a private practice in London (1666). He was an authority on the brain and the nervous system and discovered the circle of arteries at the base of the brain which is still called "the circle of Willis." He was also the first to discover the presence of sugar in the urine of diabetics. Among his published works, which were written in Latin, is "A Description of the Anatomy of the Brain" (1664), illustrated by Sir Christopher Wren.

Willkie (*wĭl'kē*), WENDELL LEWIS, lawyer and liberal politician, born at Elwood, Ind., Feb. 18, 1892; died in New York, Oct. 8, 1944. A graduate of Indiana Univ., he began practicing law in



WENDELL L. WILLKIE

1916, served in the U.S. Army during World War I, and later became president of Commonwealth & Southern, a large public utility company (1933-40). As Republican nominee for President of the U.S. in 1940, he was defeated by the Democratic candidate, Franklin D. Roosevelt, but polled a substantial popular vote. After his campaign he continued to practice law in New York City. He made a semi-official tour of England, the Middle East, Russia and China (1941-42), later condensing his experiences and ideas on international policy in a book, "One World" (1943). In 1941 Willkie became a director of Freedom House, "a co-ordinating agency and meeting place devoted to the ideal of freedom in one world." In 1945 Freedom House dedicated the Willkie Memorial Bldg. in New York City and set up the annual Wendell Willkie Memorial Award.

Will-o'-the-Wisp (*wĭl′ǫ-THę-wĭsp*). See *Ignis Fatuus.*

Willoughby (*wĭl′ô-bē*), or WILLOBIE, HARRY, English author, born in 1574(?); died in 1596(?). He is the hero and probable author of an English poem entitled "Willobies Avisa" (1594) in which appears the earliest known printed reference to William Shakespeare.

Willoughby (*wĭl′ô-by̆*), CHARLES CLARK, anthropologist, born July 5, 1857, at Winchendon, Mass.; died in Boston, Apr. 21, 1943. Almost entirely self-educated, he nonetheless became one of the leading anthropologists in the world after the director of the Peabody Museum of Archaeology and Ethnology at Harvard made him a protégé. He was assistant in the Department of Anthropology at the Chicago Exposition in 1893, returning to Boston in 1894 to become chief assistant at the Peabody Museum. He was promoted to assistant curator in 1899, assistant director in 1913, and director in 1915, a post he held until his retirement in 1928.

HUGH WILLOUGHBY

Willoughby, SIR HUGH, English sea captain and explorer, died in 1554. He was the youngest son of Sir Henry Willoughby, of Middleton, England. Appointed by Sebastian Cabot to command a fleet of three ships, he set sail from England in June 1553, in one of the numerous attempts to discover a northeast passage to China and India. The fleet anchored at the Lofoten Islands, off the northwest tip of Norway, late in July, but shortly afterward the vessels were separated by a storm. Two of them, the *Bona Esperanza,* of which he was captain, and the *Bona Confidentia,* later met and continued northeast, arriving weeks later at Arzina, near to Kegor, in Norwegian Lapland. Wintering there, without adequate provisions, Sir Hugh Willoughby and all the others aboard the two ships died. His journal, found later and printed in Hakluyt's "Voyages," showed that he and some others still survived in January 1554.

Willow (*wĭl′ō*), a class of shrubs or trees of the genus *Salix,* varying in size from shrubs of only a few inches in height to trees 40 to 75 ft. high. They usually grow by or near water and are confined almost entirely to the temperate and colder regions of the Northern Hemisphere. Many species have been described. The branches of most species are smooth and the branchlets are usually long, slender, and pliant. Most species have numerous long roots which penetrate into the moist soil and by a network of fibers help to prevent the water of streams from wearing away the banks. The

WEEPING WILLOW

slender and pliant branchlets of some species have been utilized from the earliest time for basket work and in the early history of Europe were twisted into ropes. This class of willows is known as *osier* and includes the two kinds generally called *velvet osier* and *purple osier*. The leaves of some species are used for fodder, some furnish excellent timber and valuable wood for gunpowder charcoal, and others yield bark which is rich in tannin.

Fully 160 different species of willows have been catalogued, of which 35 are native to North America. Most of the American species yield a wood which is too soft for construction purposes, but it possesses value for charcoal and fuel. It is used also in making furniture, baskets, and various household utensils. The *white willow* is especially valuable for making charcoal for gunpowder. It is planted in many places for its wood and for protection of other trees against winds, its rapid growth making it of particular value for that purpose. The *weeping willow* is a fine ornamental tree native to Asia and has been introduced in many parks and cemeteries of America. The branchlets of this species are unusually long and graceful, making a large tree very attractive. It has long been considered symbolical of mourning. The *salix regalis* is greatly admired for its white, silvery leaves.

Willowware (*wĭl′ō-wâr*). See *Chinaware*.

Wills (*wĭlz*), WILLIAM GORMAN, Irish dramatist and ballad writer, born at Kilmurry, Ireland, on Jan. 28, 1828; died Dec. 13, 1891. The son of James Wills, a writer, he was educated at the Waterford grammar school and Trinity Coll. in Dublin. He began his career as a Dublin newspaperman, shifted to portrait painting, and then became a playwright. He wrote a number of plays, the most successful of which were "Charles I," first produced in 1872, and "Olivia," in 1873, and also wrote ballads. His song, "I'll Sing Thee Songs of Araby," became familiar to music audiences in the U.S. and other countries when John McCormack, the Irish tenor, added it to his concert repertoire.

Wills, WILLIAM JOHN, Australian explorer, born at Totnes, Devonshire, England, in 1834; died in Australia, in 1861. After studying medicine in London, he emigrated to Australia in 1852, and the following year took up the practice of medicine at Ballarat. He obtained admission as a volunteer to the office of the surveyor of crown lands for the district in 1855. Later for several years he served on the staff of the magnetic and meteorological observatory at Melbourne. In 1860, as third, then second in command, he undertook an expedition under Robert O'Hara Burke, exploring the northern wilds of the Australian continent. The party reached the Gulf of Carpentaria, but he and Robert Burke died of starvation and exposure at Cooper's Creek on the return journey. The results of the expedition became known after his diary was found and published (1863).

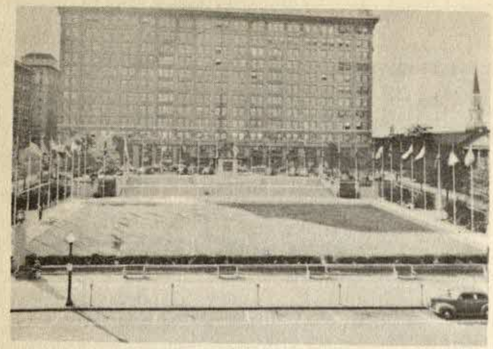
Willstätter (*vĭl′shtĕt-ēr*), RICHARD, chemist, born Aug. 13, 1872, in Karlsruhe, Germany; died Aug. 3, 1942, in Locarno, Switzerland. He was educated at the Univ. of Munich, where he taught until 1905. In that year he went to the Federal Polytechnic Inst. of Zurich as professor of chemistry and director of biochemical research, leaving in 1912 to become a fellow of the Chemical Institute of the Kaiser Wilhelm Gesellschaft in Berlin. In 1915 he was appointed professor of organic chemistry and director of the chemical laboratory at the Univ. of Munich. He retired in 1925, allegedly because of anti-Semitism on the part of university authorities, but he remained in Germany until 1939. Willstätter is particularly notable for his work on chlorophyll and other plant coloring matter. He won the Nobel Prize for chemistry in 1915 for his work in this field.

Wilmington (*wĭl′mĭng-tŭn*), county seat of New Castle County, Delaware, 28 m. s.w. of Philadelphia, Pa. It is situated on the Delaware River and is served by the Baltimore & Ohio, the Pennsylvania, and the Reading R.R.'s and many bus lines. The harbor is deep enough for large steamers. Local transit lines extend to many inland points. The site is on elevated ground, overlooking the Delaware, which is about 3 m. wide at this point, and within the city is the junction of Christina and Brandywine Creeks.

Among the chief buildings are the county-municipal building, the postoffice, the custom house, the Du Pont Building, the Delaware Trust Building, and the Equitable Building. The Holy Trinity Church, built by the Swedes in 1698, is one of the oldest ecclesiastical structures in the U.S. The public schools are well organized. It has many fine hospitals and charitable institutions, such as the State Hospital for the Insane, the Home for Children, the Florence Crittenton Home, the Home for Aged Women, the Home of Merciful Rest, and the Minquadale Home for Aged Men and Couples. It is the seat of the Ferris Industrial School.

Wilmington is important as a commercial and manufacturing center. Much water power for industrial enterprises is obtained from the Falls of the Brandywine. It has large interests in shipbuilding, the construction of railway cars and machinery, the manufacture of paper, and the production of morocco leather. The general manufactures include clothing, machinery, leather, saddlery, hardware, and pottery. It is the center of a large trade in merchandise, fruits, and general manufactures.

The site of Wilmington was first settled by the Swedes under Peter Minuit in 1638 and the



Courtesy Sanborn Studio, Wilmington, Del.

WILMINGTON, DELAWARE

Du Pont Company building, facing Rodney Square

locality was named Ft. Christina. Later the village became known as Christinaham. The Dutch under Peter Stuyvesant bought the region from the Indians in 1655 and Ft. Christina was taken by them the same year. Nine years later the place was captured by the English, after which it was added to the proprietary possessions of William Penn. Thomas Willing established a town in 1737, which became known as Willingstown, but eight years later the name was changed to Wilmington. The Battle of Brandywine took place in the vicinity of Wilmington. The town was chartered as a city in 1832. Population, 1950, 110,356.

Wilmington, county seat of New Hanover County, North Carolina, on the Cape Fear River, about 30 m. from the Atlantic Ocean. It is served by the Atlantic Coast Line and the Seaboard Air Line R.R.'s, several bus lines, three airlines, and the Intra-Coastal Waterway. The area surrounding Wilmington leads the state in the production of tobacco, corn, potatoes, and soybeans. Other industries include dairying, cattle raising, meat packing, frozen foods, canned foods, bulbs, and flowers. The city is the center of one of the largest strawberry, lettuce, and peanut districts of the world.

Wilmington is North Carolina's major seaport city, and has huge terminals, warehouses, shipyards, and marine railways. Manufactures include cotton, creosote, fertilizer, chemicals, molasses, soft drinks, hosiery, neckwear, textiles, petroleum products, and machinery. The noteworthy buildings include the Wilmington Museum of Art, the municipal building, Walker Memorial Hospital, the Community Hospital for Colored People, the St. James' Church, and a national cemetery. Founded in 1730 and formerly called Newton, the town was renamed Wilmington in 1739. The chief port of entry for the Confederacy during the Civil War, Wilmington was incorporated as a city in 1866. Population, 1950, 45,043.

Wilmot (*wĭl′mŏt*), DAVID, jurist and politician, born in Bethany, Pa., Jan. 20, 1814; died Mar. 16, 1868. After studying in his native city and at Aurora, N.Y., he took a law course and in 1834 was admitted to the Pennsylvania bar. He was elected to Congress as a Democrat in 1844, serving until 1851, and was a member of the U.S. Senate from 1861-63. In the latter year he was appointed judge of the U.S. court of claims, a post he held until his death. Wilmot is best known as the author of the *Wilmot Proviso,* a measure introduced in 1846, which provided that neither slavery nor involuntary servitude, except for crime, shall ever exist in any part of the territory purchased from Mexico. Although passing the House in amended form, it failed in the Senate. The Wilmot Proviso was brought up and debated for a number of years whenever new territories were to be organized. The doctrine embodied in it was finally established by Congress in 1861, when an act was passed prohibiting slavery "in any territory of the U.S. now existing, or which may be hereafter formed or acquired."

Wilmot Proviso (*wĭl′mŏt prô-vī′zô*). See *Wilmot, David.*

Wilson (*wĭl′sŭn*), county seat of Wilson County, North Carolina, about 45 m. from Raleigh. It is served by the Atlantic Coast Line and the Norfolk Southern R.R.'s. Situated in a tobacco-growing district, it is one of the world's largest bright-leaf tobacco markets. The manufactures include cotton yarns, cottonseed meal and oil, fertilizer, bale covering, bus bodies, wagons, hosiery, lumber, and veneer. Serving the tobacco industry are stemmeries, redrying plants, and tobacco warehouses. A tobacco festival and exposition are held annually in August. The noteworthy buildings include the county courthouse, Atlantic Christian Coll. (built in 1902 and operated by the North Carolina Christian Church), and many schools and churches. Named for Col. Louis D. Wilson, the county was formed in 1855, and was settled largely by the Irish and English. Incorporated as a town in 1849, it became a city in 1933. Population, 1950, 23,010.

Wilson, ALEXANDER, naturalist, born in Paisley, Scotland, July 6, 1766; died in Philadelphia, Pa., Aug. 23, 1813. His father was a weaver. He worked at the weaving trade for some years, but afterwards became a peddler. In the meantime he wrote a number of poems and published a small volume. He came to the U.S. in 1794 and peddled a number of years in Delaware and New Jersey. While thus engaged he studied bird life, made a collection of American birds, and in 1804 visited Niagara Falls and Western New York. Later he made a tour of the Southern states and was accompanied in some of his journeys by George Ord. His chief writing is "American Ornithology," a valuable work in seven volumes. It was not wholly completed at the time of his death; an addition to it was made by George Ord, and it was further enlarged by Lucien Bonaparte.

Wilson, CHARLES EDWARD, industrialist, born in New York City, Nov. 18, 1886. He began working in the shipping department of the Sprague Works of the General Electric Co. when he was only 13, working his way up to become executive vice president in 1937 and president in 1940. In 1942, he took a leave of absence to become executive vice chairman of the War Production Board in charge of production. Later in the year, after a dispute with the vice chairman in charge of materials, Wilson was made executive vice chairman of the board in charge of both production and materials. After making an outstanding record in stimulating war production, he resigned in 1944 and returned to General Electric. In 1946 Wilson was named chairman of a Presidential committee on civil rights. He resigned from General Electric in 1950 to direct the Office of Defense Mobilization. He relinquished this post, March 30, 1952, upon a disagreement with President Harry S. Truman during a nationwide steel strike. He was chairman of the board of W. R. Grace & Co. (1955-56).

Wilson, CHARLES ERWIN, industrialist, cabinet member, born in Minerva, Ohio, July 18, 1890; died in Norwood, La., Sept. 26, 1961. He was graduated (1909) from Carnegie Inst. of Technology and worked for the Westinghouse Electric & Manufacturing Co. (1909-19), rising to the position of chief automobile-equipment engineer. In 1919 he joined the General Motors Corp. as chief engineer and factory manager of the automobile division of the Delco Remy Co., a General Motors subsidiary. During the next 22 years he held various positions throughout the entire General Motors structure, being named president of the corporation in 1941 and chief executive officer in 1946. In January 1953 President Eisenhower appointed him Secretary of Defense. His appointment was approved by the Senate after he agreed to divest himself of his large holdings of GM stock. This action reinforced sharply an old precedent, that a Federal official should have no financial interests which might in any way be construed to influence his official actions. In his post, which he relinquished in 1957, Wilson favored centralizing defense contracts among large producers and pressed for atomic-war efficiency, with a consequent reduction in manpower.

Wilson, CHARLES THOMSON REES, physicist, born in Glencorse, Midlothian, Scotland, Feb. 14, 1869; died in Carlops, Nov. 15, 1959. He was educated at Owens Coll., Manchester, and Cambridge Univ., where he later (1925-34) served as Jacksonian professor of natural philosophy. In 1895 he began the research on atmospheric electricity which culminated in his sharing the Nobel Prize for physics, in 1927, with Arthur Holly Compton (*q.v.*) "for the method discovered by him of perceiving by condensation of steam the paths taken by electrically charged particles." He also invented the Wilson cloud chamber, by means of which the activity of the ionized particles could be observed.

Wilson, EDMUND, literary critic and author, born in Red Bank, N.J., May 8, 1895. After graduation from Princeton (1916) he worked on the New York *Sun* before serving in World War I. He was managing editor of *Vanity Fair* (1920-21), associate editor of the *New Republic* (1926-31), and a staff book reviewer for the *New Yorker* (1944-48). His books include "Axel's Castle" (1931), dealing with symbolist writers; "To the Finland Station" (1940), a study of the writing of history; "Memoirs of Hecate County" (1946), stories of the wealthy intelligentsia of a New York suburb; "Classics and Commercials" (1950), a literary chronicle; "The Shores of Light" (1952); "Five Plays" (1954); "Scrolls from the Dead Sea" (1955); and "Patriotic Gore" (1962).

Wilson, EDMUND BEECHER, zoologist, born in Geneva, Ill., Oct. 19, 1856; died in New York City, March 3, 1939. A graduate of Yale and Johns Hopkins universities (Ph.D., 1881), he taught at Williams Coll., Massachusetts Inst. of Technology, and Bryn Mawr Coll. before going to Columbia Univ. in 1891, where he taught until he retired in 1906. His special interests were embryology, cytology, and morphology, to the study of which he made valuable contributions.

Wilson, FRANCIS, actor, born in Philadelphia, Pa., Feb. 7, 1854; died in New York City, Oct. 7, 1935. He made his first stage appearance in Philadelphia as a member of a minstrel company. His début in comedy was at the Chestnut Street Theater there, in 1877. After a succession of minor parts in various plays, he became a comic-opera singer, appearing first as *Sir Joseph Porter* in "Pinafore." He returned to spoken comedy in 1904, however, and began to play leading roles in various New York productions. Later he formed his own company, in which he also acted. He was elected (1913) the first president of Actors' Equity Association. In addition to acting, he wrote several plays and books of reminiscences.

Wilson, HARRY LEON, author, born in Oregon, Ill., May 1, 1867; died in Monterey, Calif., June 28, 1939. After a public-school education, he did various kinds of work, settling in California, and beginning to write short humorous pieces for the magazine *Puck*, of which he later was the editor (1896-1902). A popular writer of light fiction from 1902 until his death, his best-known works are "Merton of the Movies" (1922, dramatized by George S. Kaufman and Marc Connelly) and "Professor, How Could You?" (1925). His "Ruggles of Red Gap" (1915), the story of an English valet transplanted to the Far West, was made into a motion picture with Charles Laughton (1935).

Wilson, HENRY, politician, born in Farming-ton, N.H., Feb. 16, 1812; died in Washington, D.C., Nov. 22, 1875. He was the son of a day laborer and at the age of 10 went to work on a farm. He was devoted to reading and study; it is said that he read about 1,000 volumes before he reached the age of 21. His original name was Jeremiah Jones Colbath, but in 1833 he changed it for some unstated reason to Henry Wilson. He learned the trade of a shoemaker at Natick, Mass., and at the same time studied at the Concord Acad. In 1840 he became noted as a public speaker in support of Harrison for the Presidency and served as a Whig in the state legislature for 10 years, but afterward denounced that party and joined the Free Soilers. In 1854, hoping that the Know Nothing party might take an active antislavery stand, he joined that group, but left it in disappointment three years later. In 1855 he became a member of the U.S. Senate as a Union candidate, and went over to the Republican party when that organization was formed. He served as chairman of the Senate committee on military affairs during the war and was one of the chief opponents of slavery. In 1872 he was elected Vice President on the ticket with President Grant. He died before the expiration of his term. Wilson wrote "Military Measures of the U.S. Congress," "History of the Antislavery Measures of the Thirty-seventh and Thirty-eighth United States Congresses," "History of the Rise and Fall of the Slave Power in America," and "A Contribution to History."

Wilson, HENRY MAITLAND, first Baron Wilson of Libya and of Stowlangtoft, army officer, born in 1881 in England. He was educated at Eton and began his military career in the Boer War. He fought in World War I and held a number of commands before he was placed (1939) in command of the British army in Egypt. He remained there until 1941, when he was appointed military governor of the province of Cyrenaica, in Libya. During the same year, he commanded British forces in Greece, Palestine, Transjordan, and Syria, and ended the year as general officer commanding the British Ninth Army. In 1942 he was made head of the Persia-Iraq command and in the following year became commander-in-chief of British forces in the entire Middle East. In 1944 he succeeded Gen. Eisenhower as supreme Allied commander in the Mediterranean theater, becoming a field marshal that same year. He headed the British Joint Staff Mission at Washington, 1945-47.

Wilson, HUGH ROBERT, diplomat and the last U.S. Ambassador to Nazi Germany, born in Evanston, Ill., Jan. 29, 1885; died at Bennington, Vt., Dec. 28, 1946. He served the U.S. as a career diplomat for 30 years, 1911-40, notably as an envoy to Switzerland, 1927-37, and Ambassador to Germany, 1938-39. President F.D. Roosevelt recalled him from the latter post in 1938 as a protest against Nazi persecution of the Jews, and Wilson served later as an adviser to the Secretary of State. He published a two-part autobiography, "Education of a Diplomat" (1938) and "Diplomat Between Wars" (1941).

Wilson, JAMES, jurist, born near St. Andrews, Scotland, Sept. 14, 1742; died Aug. 21, 1798. He studied at the Univs. of Glasgow and Edinburgh and in 1766 emigrated to Pennsylvania. For some time he was a tutor at the Coll. of Philadelphia (later the Univ. of Pennsylvania) and afterward practiced law at Reading, Pa., and at Annapolis, Md. In 1775 he was made a member of the Continental Congress, where he advocated the American cause with much earnestness, and was a signer of the Declaration of Independence. In 1787 he was a member of the committee which drafted the Federal Constitution and later took part in the Pennsylvania convention which ratified that document. He served as a judge of the Supreme Court, 1789-98. He was made the first professor of law at the Coll. of Philadelphia.

Wilson, JAMES GRANT, author, born in New York City, April 28, 1832; died Feb. 1, 1914. He studied at Coll. Hill, Poughkeepsie, N.Y., and later joined his father in the book business at Chicago. At the beginning of the Civil War he was commissioned as a major, served in a number of important battles under Banks and Grant, and in 1865 was promoted to the rank of brigadier general. He settled in New York City as a writer after the close of the war. In 1884 he became president of the New York Genealogical and Biographical Society. He published "Life and Campaigns of Ulysses Simpson Grant," "Life and Letters of Fitz-Greene Halleck," "Sketches of Illustrious Soldiers," "Memorial History of the City of New York," "Poets and Poetry of Scotland," and "Bryant and His Friends," among others. He was coeditor with John Fiske of "Appleton's Cyclopaedia of American Biography."

Wilson, JAMES HARRISON, soldier, born at Shawneetown, Ill., Sept. 2, 1837; died Feb. 23, 1925. After being graduated from the U.S. Military Acad., in 1860, he was assigned to the corps of topographical engineers. He was aide-de-camp to Gen. McClellan in the Maryland campaign, served as inspector general of the Army of the Tennessee at Vicksburg, and was brevetted major general of volunteers in 1864, for "gallant and meritorious services." In 1865 he took part in the Battles of Franklin and Nashville and in the same year conducted a cavalry expedition into Alabama and Georgia, capturing Selma and Montgomery, Ala., and Columbus and Macon, Ga. He was major general of U.S. volunteers in the war against Spain, taking part in the occupation of Cuba and in the Puerto Rican campaign, and during the Boxer Rebellion joined the China relief expedition, doing much to secure control of the entrance to Peking. In 1901 he was placed on the retired list. He published "The Life of Ulysses S. Grant," "Life and Services of Maj. Gen. Alexander McCook" and "China: Travels and Investigations."

Wilson, JOHN, author; pseudonym, CHRISTOPHER NORTH, born in Paisley, Scotland, May 19, 1785; died April 3, 1854. He first studied under a private tutor and afterward at Glasgow Univ. and Oxford, being graduated from the latter in 1807. In 1811 he married Jane Penny, a lady of Liverpool, and soon published his first volume of poems, entitled "The Isle of Palms." Later he settled on an estate near Windermere, where he formed warm friendships with Coleridge, Wordsworth, De Quincey, and Southey. When *Blackwood's Magazine* was established, in 1817, he became one of its chief contributors. In 1820 on the strength of his Toryism, he was appointed professor of moral philosophy at Edinburgh Univ., a position which he filled until 1851, when he resigned because of failing health. A pension of $1,500 a year was conferred upon him at his retirement. Most of his writings were published as magazine articles, the best known of these being *"Noctes Ambrosianae,"* a series of imaginary conversations supposed to have taken place in Ambrose's Tavern; although some of these essays were written by others, the majority were by Wilson. He also published "The City of the Plague" (poetry), "The Trials of Margaret Lindsay," "Lights and Shadows of Scottish Life," "The Recreations of Christopher North," and "The Foresters."

Wilson, JOHN, missionary, born at Lauder, Scotland, Dec. 11, 1804; died June 8, 1881. He studied at the Univ. of Edinburgh and in 1828 began missionary work at Bombay, India. In 1843 he took up the mission work of the Free Church of Scotland. His work is important in that he exercised a wide and powerful influence upon the educational and social affairs of the Indians. He became well-versed in Oriental literature and in languages, and established numerous native schools. For some time he was vice chancellor of the Univ. of Bombay. His numerous writings include "The Lands of the Bible," "An Exposure of the Hindu Religion," "India 3,000 Years Ago," and "The Parsi Religion Unfolded."

Wilson, WILLIAM BAUCHOP, politician and labor leader, born at Blantyre, Scotland, in 1862; died May 25, 1934. He came to the U.S. in 1870, worked in the coal mines of Pennsylvania, and served eight years as secretary of the United Mine Workers of America (which he had helped to organize). In 1906 he was elected to Congress on the Democratic ticket and was twice re-elected. He entered the cabinet of President Wilson in 1913 as the nation's first Secretary of Labor. Serving until 1921 as head of this new department, he did pioneer work in fostering labor mediation.

Wilson, WILLIAM LYNE, politician and university president, born in Jefferson County, Virginia (now in West Virginia), May 3, 1843; died Oct. 16, 1900. After studying at Charlestown Acad. he entered Columbian Coll. (now George Washington Univ.), Washington, D.C., and was afterward graduated from the Univ. of Virginia. He served in the Confederate Army during the war, held a professorship in Columbian Coll., and later practiced law at Charleston, W. Va. He later became president of the Univ. of West Virginia. In 1882, he was elected to Congress as a Democrat, serving in that body as an influential member for six consecutive terms. He was a pronounced advocate of civil-service reform and tariff revision. He introduced the Wilson Tariff Bill (1894). Defeated for re-election in 1894, he was appointed Postmaster General by President Cleveland. He became president of Washington and Lee Univ. in 1897.

Wilson, (THOMAS) WOODROW, 28th President of the U.S., born at Staunton, Va., Dec. 28, 1856, son of Joseph R. and Jessie Woodrow Wilson; died Washington, D.C., Feb. 3, 1924. After informal preparatory schooling he attended Davidson Coll. in North Carolina and Princeton Univ., being graduated from the latter in 1879. The following two years he spent at the Law School of the Univ. of Virginia, and a short time later he tried unsuccessfully to practice law in Atlanta, Ga. Feeling himself a failure as a lawyer and thinking that he had finally abandoned his youthful political ambitions, he went to the Johns Hopkins Univ. at Baltimore, where he obtained his Ph.D. in political science in 1885. In the same year he married Ellen Louise Axson, of Rome, Ga., who, until her death in 1914, was his constant companion. From 1885 until 1902 Wilson taught at Bryn Mawr, Wesleyan (Middletown, Conn.), and Princeton, winning himself a reputation as an outstanding scholar and thinker. His most widely read book was "Congressional Government" (1885), a study of the practical functioning of the American Federal government, but more scholarly were "The State" (1889) and "Division and Reunion" (1893). Elected president of Princeton in 1902, he proceeded during the following eight years to reorganize the curriculum and the method of undergraduate instruction. No man in Princeton's 200 years has done more than Wilson did to advance her intellectual standing, yet the closing years of his university administration were plagued by bitter and tragic controversies. In the struggle to reorganize the social life of the undergraduates Wilson was defeated by the alumni and students themselves; in the conflict over the location and control of the graduate college Princeton was preparing to erect, Wilson was defeated by his bitterest enemy, Andrew F. West, dean of the

Graduate School, who eventually caused his resignation from the presidency of the university in 1910.

Meanwhile, however, Wilson had emerged as a leading champion of conservative economic and political policies in the country, and George Harvey, a New York editor, proposed to launch Wilson on a political career that would end in the White House. Harvey persuaded the Democratic party in New Jersey to nominate Wilson for governor in 1910. Accepting the nomination, Wilson during the campaign surprised his sponsors by going over completely to the progressives, who were demanding reform on a broad front. Immediately after his election by a tremendous majority, Wilson seized control of the party from the old-line bosses and thwarted the effort of James Smith, Jr., of Newark, the leading boss, to go to the U.S. Senate. During 1911 the new governor pushed through the legislature bills providing for sweeping primary and election reforms, workmen's compensation, and an effective public utilities commission. His spectacular triumphs in New Jersey inevitably constituted Wilson one of the leading contenders for the Democratic Presidential nomination in 1912. The retirement of W. J. Bryan (*q.v.*) from active leadership in the party resulted in a desperate struggle between progressives and conservatives for control of the national party machinery. By and large, the progressives supported Wilson, who was nominated at Baltimore in 1912. Theodore Roosevelt had disrupted the Republican party only a few weeks before when he failed to win the Republican nomination; in August he organized a new Progressive party and ran for President on its ticket. President Taft, the Republican nominee, refused to campaign. Roosevelt and Wilson both emphasized the monopoly question almost to the exclusion of all other issues, and Wilson won largely because Roosevelt had split the Republican vote. Wilson was inaugurated in 1913 determined to carry out the main objectives of his program, which he believed would bring to America a new birth of economic freedom. First, he led a Democratic Congress in writing the Underwood Tariff Act of 1913, which for the first time since 1857 effected a substantial reduction of duties and deprived great trusts of protection. Next, as a result of his own study and of the investigations of a Congressional committee into the so-called Money Trust, Wilson persuaded Congress to adopt the Federal Reserve Act, which completely reorganized the nation's antiquated banking and currency system and placed it on a scientific and flexible basis. In 1914, Congress, at Wilson's request, rewrote the anti-trust laws and established a commission with broad powers to enforce them. The pre-World War I years were an era of reform, and these measures were followed by other important accomplishments that were the work of other men. Among these were the La Follette Seamen's Act (1915), the Federal Farm Loan Act of 1916, the Adamson Eight-Hour Law (1916), and a series of laws completely overhauling our colonial policy.

From the very outset of his administration Wilson was beset by difficulties in foreign affairs. He attempted sincerely to prevent intervention in Mexico, which was then torn by recurrent civil wars, but on two occasions he did intervene—at Vera Cruz in 1914, and in the punitive expedition against Francisco (Pancho) Villa (*q.v.*) in 1916. Although the anti-imperialist, Bryan, was Secretary of State, the Wilson administration generally carried on the "dollar diplomacy" in the Caribbean that had been inaugurated by Theodore Roosevelt and continued by Taft, and American protectorates were established by Wilson in Haiti, the Dominican Republic, and Nicaragua. Wilson did, however, make a genuine, if unsuccessful, effort to restore friendly relations with Colombia, which Roosevelt had alienated by seizing the Isthmus of Panama. In the summer of 1914 World War I erupted in Europe, and from that time on Wilson was compelled to devote most of his energies to an effort to keep America neutral in a world torn by war.

In the election of 1916, Wilson was opposed by Charles Evans Hughes (*q.v.*), who had resigned from the Supreme Court to accept the Presidential nomination of a reunited Republican party. Hughes campaigned vigorously, but Wilson made scarcely any campaign and refused to leave Washington on speaking tours. The brunt of the Democratic campaign was carried by Bryan and his followers in the South and West, of whom most were opposed to intervention, as was Bryan himself. "He kept us out of war" (spoken of Wilson at the national convention in St. Louis) became the great Democratic battle cry; although this phrase implied no promise that Wilson would succeed in maintaining neutrality, it was particularly effective in the West. The election of 1916 was one of the closest in the country's history. Hughes carried all of the East except Ohio and most of the Mid-West, but the South and West combined to keep Wilson in the White House. Another 1,900 Republican votes in California would have swung the election in Hughes' favor.

Until the Germans launched their submarine campaign in February 1915 the problem of keeping neutral was relatively simple. The British were violating our rights as neutrals, to be sure, but Wilson was from the start sympathetic to the British cause, and this would never have resulted in our belligerency. But when a German submarine sank the liner *Lusitania* in May 1915, causing the death of over 100 Americans, Wilson was confronted with the nation's most serious diplomatic

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crisis since the Civil War. In the negotiations that followed the sinking of the *Lusitania*, the Germans agreed to respect American shipping, but Wilson demanded a complete cessation of the submarine campaign. The problem would have been a great deal easier to solve if Wilson had not insisted on the right of Americans to travel on belligerent ships, but he refused to compromise this right. For a time, after the sinking of the *Sussex* in 1916 and until February 1917, Germany halted her undersea warfare, and during this period Wilson came to see that the war was nothing more than an imperialistic conflict in which both sides were equally at fault. He was, therefore, heartbroken when the German government announced early in 1917 a resumption of unrestricted submarine warfare. There was now nothing to do but to accept the challenge, and the U.S. entered the war in April. With a rapidity that startled Europe, America mobilized for a total effort to defeat the German Empire. Universal military service was immediately inaugurated and a large army was raised; industry and labor at home were regimented and organized on an unprecedented scale; the railroads were taken over by the government; food and fuel were strictly rationed; millions of tons of shipping were built to frustrate the German submarines; and public opinion was mobilized on a national scale. Above and directing the whole war effort was Wilson. His war addresses inspired the American people to a great idealistic crusade not only to win the war, but to make the world "safe for democracy." Unfortunately, much more hysteria than patriotism was inspired by Wilson's pronouncements, with the result that civil liberties were ruthlessly suppressed, not only by local citizens themselves, but by the government also. The most notable case was the arrest and imprisonment of Eugene V. Debs (*q.v.*), Socialist party leader, for opposition to the war effort. After the failure of the great German attack of the summer of 1918 it was obvious that the Germans were beaten. America had thrown her strength into the balance in time to prevent a German victory. Wilson alone handled the negotiations for the German surrender, the basis for which were the Fourteen Points which Wilson had described as America's war objectives. Wilson's contributions to the cause of international peace brought him the Nobel Peace Prize in 1919.

At the Versailles peace conference in 1919, Wilson labored desperately to obtain the adoption of a treaty based on the Fourteen Points, but the war, at least from the European view, had degenerated into a battle for spoils, and Clemenceau of

France, Lloyd George of England, and Orlando of Italy set about to divide them. The only thing Wilson was able to salvage from the wreckage of Versailles was an agreement for a League of Nations, which he hoped would prevent future wars and eventually help to ameliorate the severity of the peace terms. What followed at home was nothing less than a nightmare. Wilson had alienated Republican support when he failed to take any prominent Republican leaders with him to Paris, and in the fight in the Senate over the ratification of the peace treaty his tactics were not calculated to soothe ruffled Republican feelings. The result was a general partisan battle that wrecked the treaty and the League. The Republican senators under Henry Cabot Lodge (*q.v.*) of Massachusetts refused to ratify the treaty without certain reservations, which Wilson would not accept. Although it has been estimated that well over two-thirds of the Senate at one time or another had voted for entry into the League, and undoubtedly an overwhelming majority of the people agreed, neither side would give in to the other, and the treaty failed in March 1920. Meanwhile, Wilson had begun a tour of the country to arouse pro-League sentiment, but at Pueblo, Col., in the latter part of September 1919, he suffered a nervous collapse which was followed by a paralytic stroke a short time later, and for the remainder of his term he was largely unable to perform the duties of his office. He went out of office in 1921, bitter and broken in body and spirit. Three years later he died, and his body was interred in the Bethlehem Chapel of the unfinished Washington Cathedral. See also *World War I.*

Wilson's Creek (*wĭl′sŭnz ḳrēḳ*), BATTLE OF, a battle fought near Wilson's Creek, about 10 m. S. of Springfield, Mo., on Aug. 10, 1861, during the American Civil War. The battle was enjoined the night before when the Federal forces, under Gen. Lyon, attempted a flanking movement. In all, about 5,500 Federal troops faced 13,000 Confederate troops under Gen. McCulloch. The Confederate troops were victorious, repulsing the Federal attack. Gen. Lyon was killed during the action. Losses amounted to about 1,100 on each side.

Winant (*wī′nạnt*), JOHN GILBERT, public official, born Feb. 23, 1889, in New York City. He was educated at Princeton Univ. and later settled in New Hampshire, where he served in the House of Representatives from 1917-21 and again from 1923-25. He was a member of the state senate from 1921-23 and was elected governor in 1925. He later served two additional gubernatorial terms between 1931-34. In 1935, he became assistant director of the International Labor Office in Geneva, resuming the office in 1937 after spending two years as chairman of the Social Security Board in the U.S. In 1939, he became director of the International Labor Office, where he remained until 1941, when President Roosevelt named him ambassador to Great Britain. He served as U.S. representative on the European Advisory Commission to co-ordinate Allied policy in Europe during the war. In 1946, he resigned as ambassador to Britain to serve as U. S. member on the U. N. Economic and Social Council until January 1947. He committed suicide Nov. 3, 1947.

Winchell (*wĭn′chĕl*), WALTER, journalist, born in New York City, Apr. 7, 1897. After brief schooling he began working as a singer and vaudevillian. At one time he was a member of a trio including George Jessel and Eddie Cantor, who were later to become famous. Enlisting in the Navy in World War I, he later returned to vaudeville. He became a columnist and drama critic for the New York *Graphic* in 1923 and in 1929 he went to work for the New York *Mirror* for which he writes a syndicated column called "On Broadway," reaching several million readers daily. His column and his weekly radio broadcasts are characterized by news "scoops," political crusading, and gossip about men and women in public life.

Winchendon (*wĭn′chẹn-dŭn*), a town in Worcester County, Massachusetts, on the Millers River, 68 m. N.W. of Boston on the Boston & Albany and Boston & Maine R.R.'s. Surrounded by a productive agricultural and lumber region, the town has manufactures of machinery, toys, furniture, hardware, woodenware, and textiles. The woodworking industry of the town specializes in the manufacture of educational toys. The region was settled in 1752, and the community, which includes today three villages (Winchendon, Waterville, and Winchendon Springs), was incorporated as a town under its present name in 1764. Population, 1940, 6,575; in 1950, 4,019.

Winchester (*wĭn′chĕs-tẽr*), county seat of Clark County, Kentucky, 18 m. S.E. of Lexington. It is served by the Louisville & Nashville and the Chesapeake & Ohio R.R.'s, bus lines, and an airport. The city is situated in the blue grass region at the foothills of the Kentucky Mts., and is principally an agricultural community. The most important crops are alfalfa, tobacco, hemp, corn, wheat, timothy, and bluegrass seed. It is an important poultry and livestock center, producing dairy cattle, hogs, sheep, and turkeys. Manufactures include flour, hogsheads, clothing, fertilizer, and building materials. The principal buildings include the old Clark County courthouse, the Hickman House (1814), and the Clark Mansion. The city, which was named for Winchester, Va., was incorporated in 1792. Population, 1950, 9,226.

Winchester, county seat of Scott County, Illinois, 84 m. N.W. of St. Louis, Mo. The city is on the Chicago, Burlington & Quincy R.R., and has a monument to Stephen A. Douglas (*q.v.*), who once practiced law there. Population, 1950, 1,591.

Winchester, a residential town in Middlesex County, Massachusetts, 8 m. N.W. of Boston. It is served by the Boston & Maine R.R. and has plants making leather goods, glue, gelatin, felt products, and watch parts. Known successively as Waterfield (1638), Charlestown Village (1640), and Woburn (1642), it was incorporated as Winchester in 1850. Population, 1940, 15,001; 1950, 15,509.

Winchester, county seat of Frederick County, Virginia, 125 m. N.W. of Richmond, served by the Pennsylvania and the Baltimore & Ohio R.R.'s. It is surrounded by a fertile farming and stock-raising country and is the center of one of the largest apple-growing regions in the Eastern U.S. Winchester produces woolen goods, rubber products, machinery, and apple by-products. The Shenandoah Apple Blossom Festival is held here in the spring of each year. The points of interest include the former jail building (1764), the headquarters of Gen. Philip H. Sheridan (*q.v.*), and the colonial Red Lion Tavern. Winchester changed hands 73 times during the Civil War, and it was here that Sheridan heard of the Battle of Cedar Creek and started on his famous ride to save the day. The town was incorporated in 1874. Population, 1950, 13,841.

Winchester, a city and municipal borough of southern England, in Hampshire County, 11 m. N.E. of Southampton and 66 m. S.W. of London. It was the Caer Went of the ancient Britons, the Venta Belgarum of the Romans, and the Winteceaster of the Saxons. As the capital of the kingdom of Wessex, it was the place where the early English monarchs were crowned and made their residence and where the early Parliaments were held. During the later Middle Ages, it was noted for its woolen products. Winchester's long-held position of importance in church matters is exemplified by its cathedral, the largest Gothic church in Europe. Founded in 1079, the cathedral is an impressive example of early Norman architecture; especially noteworthy are the aisled transepts and the elaborate groining of the nave. Izaak Walton, Jane Austen, and Bishop Samuel Wilberforce (*qq.v.*) are buried in the cathedral. The Great Hall, part of a castle built by William the Conqueror, contains a round table traditionally held to be that of King Arthur; Sir Thomas Malory (*q.v.*) identified Winchester with Arthur's Camelot. The castle was largely destroyed during the Civil War, when Winchester remained loyal to the king. Winchester School, founded (1393) by William of Wykeham, is the oldest and one of the most famous of the English public schools. Population, 1951, 25,710; 1956 (est.), 27,580.

Winchester, OLIVER FISHER, manufacturer, born in Boston, Mass., Nov. 30, 1810; died in New Haven, Conn., Dec. 11, 1880. After working as a farm hand, store clerk, carpenter's apprentice, and shirt manufacturer, he became (1856) proprietor of the Volcanic Repeating Arms Co. in New Haven. In 1857 he reorganized the company as the New Haven Arms Co., with himself as president. In 1860 he began producing a breech-loading rifle (*q.v.*). This weapon was later developed (1866) into the famous Winchester rifle; and the company which manufactured it, in a final reorganization, became (1866) the Winchester Repeating Arms Co.

Winckelmann (*vĭng'ḳẹl-män*), JOHANN JOACHIM, archaeologist and historian, born in Stendal, Prussia, Dec. 9, 1717; died in Trieste, June 8, 1768. Although the son of a poor shoemaker, he was enabled to attend the gymnasium (secondary school) in Berlin, and later (1738) to study theology at the Univ. of Halle, where he eked out a living by giving private lessons. In 1743 he received a teaching position in the school at Seehausen, and in 1748 he became librarian to the Count von Bünau in Dresden. Here he had an opportunity to continue the study of art and archaeology which he had begun at Halle. Winckelmann was converted to the Roman Catholic Church in 1754, and the next year he was sent by the papal nuncio to Italy. Thereafter, he devoted himself entirely to the study of art in the Vatican Library and to archaeological research in southern Italy. For a number of years, he was papal antiquary at Rome. His first work, "*Gedanken über die Nachamung der grieschischen Werke in der Malerei und Bildhauerkunst,*" appeared in 1755. His most important and influential book was "*Geschichte der Kunst des Altertums*" (1764). These works were translated into English at the beginning of the 19th century.

J. J. WINCKELMANN

Winckelmann's importance to the history of art is twofold—he combined archaeological research with general aesthetic evaluations, and he liberated the science of antiquity from a dry philological approach. He achieved the latter by showing the specific values of that epoch and identifying the connection between ancient literature and ancient art; accordingly, his influence was felt for a long time after his death. In 1768 he was murdered in Trieste by an Italian to whom he had shown some valuable coins.

Winckler (*vĭngk'lĕr*), HUGO, orientalist, born in Gräfenheinischen, Germany, July 4, 1863; died in Berlin, April 19, 1913. Educated at the Univ. of Berlin, he served as professor there from 1904 until his death. He made excavations (1903-04) at the Phoenician city of Sidon (*q.v.*). Later (1906-12), at Boghazkeui in central Turkey, he identified the ancient capital of the Hittites and discovered a set of Hittite cuneiform tablets which greatly extended modern knowledge of Hittite civilization and language.

Wind (*wĭnd*), the natural horizontal motion of the air relative to the earth. The primary cause of wind is the nonuniform temperature of the atmosphere brought about by the unequal heating of the earth's surface by the sun. A warm mass of air is less dense than the cooler air adjacent to it; therefore the atmospheric pressure in the heated mass is less than the pressure prevailing in the cooler mass, so the air commences to move horizontally from high to low pressure. The current does not continue to move directly from high to low pressure, however, because of the deflecting force of the earth's rotation, which turns the current to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. The winds comprise an intricate system that results from the interaction of the temperature differences, the earth rotation, frictional drag, the evaporation and condensation of water vapor, and the compressibility of the air. The large-scale systems such as the trade winds (see *below*) and the high-level westerlies (see *below*) are reflections of the temperature differences that exist between the tropics and the polar zones, while the small-scale systems, such as the sea breeze (see *below*), are produced by temperature differences that occur over a comparatively small area. See also *Storm*.

WIND DIRECTION: The wind direction is designated as the direction from which the current is moving, *i.e.*, a wind from west to east is a west wind, etc. A wind is said to be "veering" if its direction is changing with time in a clockwise sense and is said to be "backing" if its direction is changing in a counterclockwise sense.

WIND MEASUREMENT: Near the surface of the earth, the speed of the wind is measured by means of an instrument called an anemometer. At upper levels, wind speed is measured by releasing a small balloon and plotting its movement as it rises through the upper air currents.

WIND LOCAL NAMES: Winds that have notable characteristics usually have local names as follows: *buran* (or purga) is a violent winter wind of Siberia and Russia; *etesian*, a northerly summer wind over the Aegean Sea; *gregale*, a strong northeast wind of the central Mediterranean; *haboob*, a dense dust-storm and sandstorm wind of the deserts of Arabia, Egypt, and India; *harmattan*, a northerly wind of the Sahara; *karaburan*, an early-spring wind of the Gobi Desert which brings dust storms; *minuano*, a cold southwest wind of southern Brazil; *mistral*, a cold, dry wind from the north over the Mediterranean; *norther*, a cold northerly wind over Texas and northern Mexico; *papagayas*, a northerly wind over the Gulf of Papagayo; *papero*, a gale from the southwest across the pampas of Argentina and Uruguay; *solano*, a hot, moist, but dusty, east wind of the southeast coast of Spain; *simoom*, a severe dust storm of the Sahara desert; *Taku wind*, a gusty east-to-northeast wind at the mouth of the Taku (Alaska) River in Alaska; *Tehuantepecers*, an extension of the Texas norther into the Gulf of Tehuantepec; *williwaw*, a violent squall in the Strait of Magellan; and the *willy-willy*, a rotating storm similar to a typhoon, moving from the Timor Sea over western Australia. See also local names below under *bora* and *foehn* types of wind system.

WIND PRESSURE: The pressure exerted by the wind increases enormously as the speed increases. For example, the total pressure of a 5-m.p.h. wind on a flat wall 20 ft. by 50 ft. is only 120 lb.; this increases to nearly a ton with a 20-m.p.h. wind, 6 tons in a 50-m.p.h. wind, and 24 tons in a 100-m.p.h. wind.

WIND SYSTEMS: The general circulation of the atmosphere is dominated by the large-scale wind systems, upon which are superimposed a multitude of minor circulations. The *trade winds* form the world's largest and most uniform surface-wind system, covering a zone roughly from 30° N. to 30° S. lat. In the Northern Hemisphere, the direction is mostly northeast and in the Southern Hemisphere southeast, with a belt (the doldrums) between that lies roughly over the equator. The zone of *westerlies* is approximately between 30° and 70° lat. in both hemispheres. Near the surface, the winds blow from all directions, but the net air movement during a year is from the west. At high levels (above a mile) the movement from the west is more regular, and the great majority of air moves out of the quadrant included between northwest and southwest. Between the trades and the westerlies, there is a subtropical high-pressure belt (the horse latitudes) characterized by light, variable winds and noted for its periods of complete calm. The polar regions from 70° to 90° N. and S. lat. are areas of variable winds, but the net movement is from the east, and for that reason they are known as the *polar easterlies*.

The *monsoon* is the largest local wind system superimposed upon the general wind pattern described above. The monsoon is of a seasonal nature, owing its existence to the seasonal temperature difference between a large land mass and the ocean. The monsoon that blows toward the hot interior of India and southeastern Asia during the summer is the most pronounced monsoon, but many others exist. A weak monsoon prevails along the Gulf of Mexico coast in the southern U.S., and the cold winter outflow from Siberia and China toward the Pacific is another important monsoon.

The *sea breeze* is a miniature monsoon that is created daily as the terrain along a narrow coastal strip becomes warmer than the coastal waters. It dies out when the sun sets and the land cools. The *land breeze* is the reverse of the sea breeze, as it is caused by the nocturnal cooling of the coastal terrain while the water temperature remains the same. When a sufficient temperature difference has been reached, the cool air from the land blows out over the ocean. The strongest land and sea breezes develop in the tropics, where the temperature difference between land and ocean is most marked. However, a strong wind such as the trades can counteract the weaker sea breeze and reduce this effect. A *bora* type of wind is the flow of air (downslope due to its weight) that comes from extreme cooling; therefore, the winds off icecapped Greenland and Antarctica are boras. Cold plateaus are also the seat of boras. Spain has a bora known locally as the *nevada,* while the bora of the Iranian section of the Persian Gulf has the Arabic name of *nashi.* The *foehn* is likewise a downslope wind, but it starts downslope only moderately cool and is subsequently heated by compression as it descends; hence, it is a warm, dry wind. On the eastern slopes of the Rocky Mts., the foehn is known as the *chinooḳ,* while in southern Europe it is known as the *sirocco.*

See also *Meteorology; Signal; Weather Bureau.*

Windaus (*vĭn'dows*), ADOLF, biochemist, born in Berlin, Germany, Dec. 25, 1876; died in Göttingen, June 9, 1959. After teaching at the universities of Freiburg and Innsbruck (in Austria), he was professor of chemistry and director of the chemical laboratory at the Univ. of Göttingen, 1915-44. For his research on sterols and their relation to vitamins, he received the 1928 Nobel Prize in chemistry. Later, he discovered and prepared synthetically vitamin D_3, the component of vitamin D which prevents rickets.

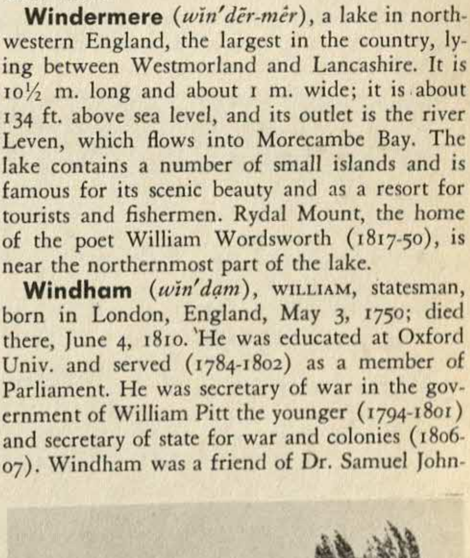
Windbreak (*wĭnd'brāḳ*), a clump of trees or shrubs used to break the force of the wind. Windbreaks are most frequently used in dust-storm areas to prevent soil erosion.

Windelband (*vịn'dẹl-bạnt*), WILHELM, philosopher, born in Potsdam, Prussia, May 11, 1848; died in Heidelberg, Germany, Oct. 22, 1915. He was professor of philosophy at the universities of Zurich (1876), Freiburg im Breisgau (1877-81), Strasbourg (1882-1903), and Heidelberg (1903-15). His principal work is "The History of Modern Philosophy" (1902); his other writings include *"Geschichte und Naturwissenschaft"* (History and Natural Science, 1894) and *"Einleitung in die Philosophie"* (Introduction to Philosophy, 1914).

Winder (*wĭn'dẽr*), WILLIAM HENRY, soldier, born in Somerset County, Maryland, Feb. 28, 1775; died in Baltimore, Md., May 24, 1824. He studied at the Univ. of Pennsylvania and took up the practice of law. In the War of 1812 he was made a colonel and in the same year commanded an expedition that invaded Canada from Black Rock, N.Y. The following year he was promoted to brigadier general and was taken prisoner at Stony Creek but was released in 1814. He commanded at the Battle of Bladensburg; his defeat there permitted the British to occupy Washington. After the war, he returned to the practice of law in Maryland; later, he was elected to the state senate.

Windermere (*wĭn'dẽr-mēr*), a lake in northwestern England, the largest in the country, lying between Westmorland and Lancashire. It is 10½ m. long and about 1 m. wide; it is about 134 ft. above sea level, and its outlet is the river Leven, which flows into Morecambe Bay. The lake contains a number of small islands and is famous for its scenic beauty and as a resort for tourists and fishermen. Rydal Mount, the home of the poet William Wordsworth (1817-50), is near the northernmost part of the lake.

Windham (*wĭn'dạm*), WILLIAM, statesman, born in London, England, May 3, 1750; died there, June 4, 1810. He was educated at Oxford Univ. and served (1784-1802) as a member of Parliament. He was secretary of war in the government of William Pitt the younger (1794-1801) and secretary of state for war and colonies (1806-07). Windham was a friend of Dr. Samuel John-



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WINDBREAK OF POPLAR TREES

son, Edmund Burke, and other great men of the time; his diary for the years 1784-1810 was published in 1866. Throughout his career he was a strong advocate of religious liberty and military reforms.

Wind Instrument (*wĭnd ĭn′strōō-mĕnt*), any musical instrument in which the tone is generated by a vibrating column of air. Except for the organ, which is operated by mechanical means, wind instruments are blown by the player. They are divided into two main groups: the woodwinds, and the brass winds or brasses. The first group includes the flutes, clarinets, and oboes, while the brasses include the bugle, cornet, trombone, trumpet, tuba, French horn, and ophicleide. Such instruments as the saxhorn, saxophone, bagpipe, and sarrusophone are hybrid wind instruments. See *Music; Orchestra.*

Windisch-Graetz (*vịn′dĭsh-grâts′*), or WINDISCHGRATZ, PRINCE ALFRED CANDIDUS FERDINAND ZU, Austrian field marshal, born in Brussels, Belgium, May 11, 1787; died in Vienna, Austria, March 21, 1862. He entered the Austrian army (1804) and took part in the Napoleonic wars, distinguishing himself in the campaigns of 1813-14. At the outbreak of revolution (March 1848) in the Austrian empire, he was military governor of Bohemia. He crushed insurrections in Vienna and Prague and was instrumental in obtaining the abdication (Dec. 2, 1848) of Emperor Ferdinand in favor of Francis Joseph I (*q.v.*). In April 1849 Windisch-Graetz was defeated by Hungarian revolutionists and was subsequently removed from his command. Later, he held a number of official posts.

Windlass (*wĭnd′lạs*), a hoisting apparatus operated by means of a wheel and axle. It consists of a horizontal cylinder turned by a crank, the action of which reels in or out a rope or chain. Typical examples of the windlass are the bucket-raising mechanism of a well, the cables of an elevator, and, on shipboard, the cargo-loading and anchor-raising devices. In the latter instances, the windlass is power driven. The *capstan,* a type of windlass in which the cylinder is vertical, is a motor-driven device by which ships are warped in to the pier. See *Wheel and Axle.*

Windmill (*wĭnd′mĭl*), a machine turned by the wind and designed to furnish motive power, as for pumping or for operating mills. Machines of this kind came into use in Europe about the 11th century. They consisted essentially of a rotating cap attached to the tower, with four to six canvas-covered frames to receive the wind and an eccentric attached to the shaft for driving the machinery below. Similar structures are still employed for pumping in the dike region of The Netherlands. The windmills used extensively at present for pumping water on farms consist of a tower, usually of open trestlework, within which is a shaft topped by a rotary shaft set at right angles, bearing a steering rudder at one end and a system of adjustable sails radiating from the other.

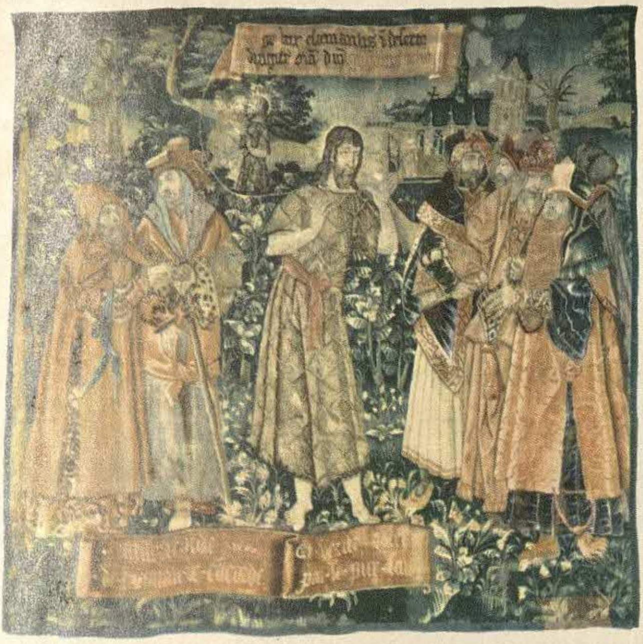
DUTCH WINDMILL

In most mills, the sails are made of narrow wooden slats, forming a circular disk, but sheet iron and steel turbine sails have come into general use within recent years. To keep the sails facing the wind, a self-adjusting fan or flyer is attached to the projecting framework at the rear. As the mill is turned by the air, it revolves a crank, which transmits motion to the machinery below. Power cannot be obtained by means of a windmill unless there is a reasonable movement of air. Considerable advantage is gained by placing the windmill on a lofty tower, but it has been found that the average time a windmill can be utilized does not exceed 10 hours out of 24, though this depends largely upon its locality. On many farms, a float mechanism is placed in a watering tank, which serves to stop the mill when the tank is pumped full of water. In some localities, land is irrigated by water pumped by windmills.

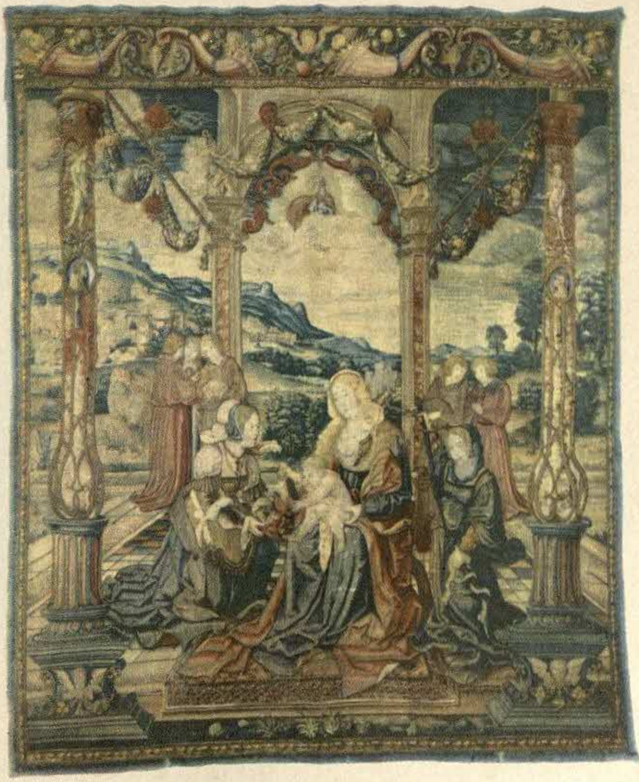
In recent years a special type of windmill has come into use for generating electric power for isolated farms. These operate generators, creating power which is stored in batteries like those of motorcars. In the Western states, where winds are frequent and fairly steady, these have been found satisfactory.

Window (*wĭn′dô*), an opening in a wall, roof,

EUROPEAN TAPESTRIES I



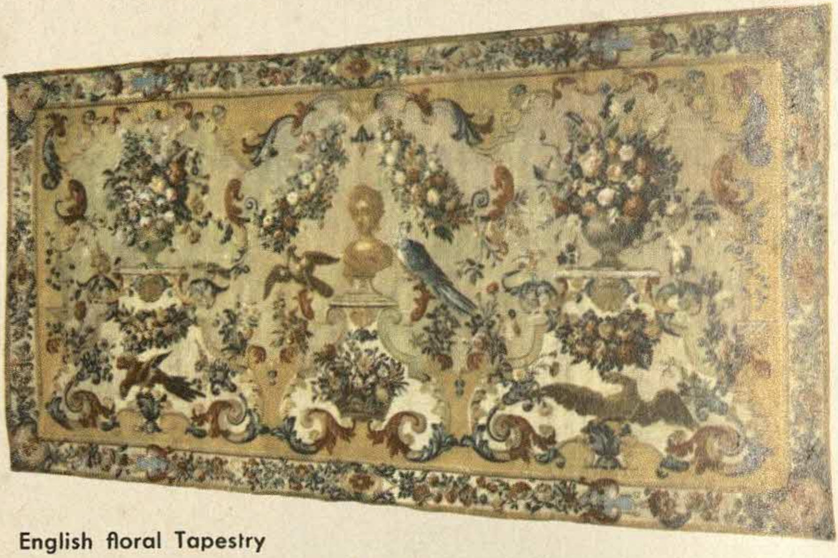
French Gothic Tapestry, "St. John in the Wilderness," early 16th century.



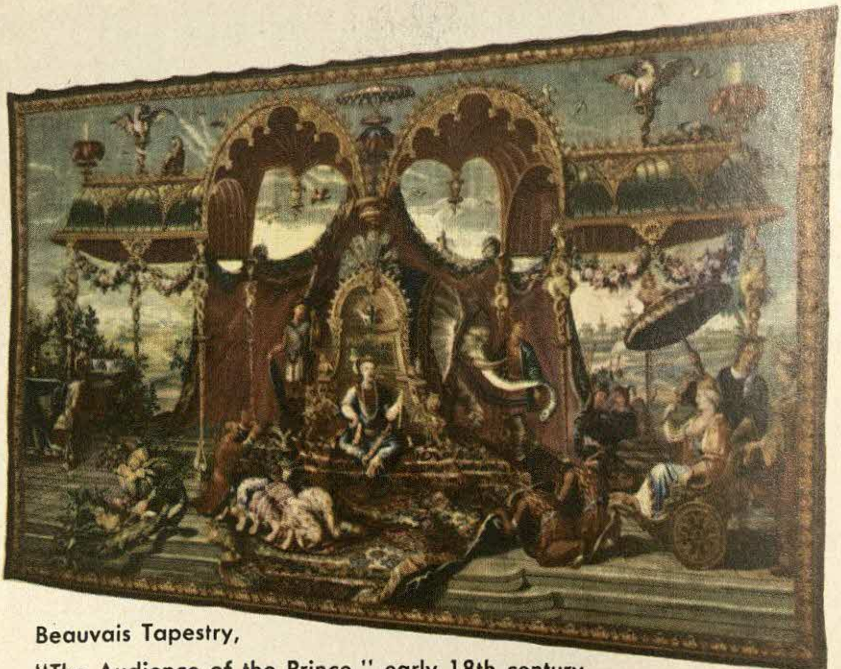
Italian Renaissance Tapestry with metal thread, "Madonna and Child With Adoring Saints," early 16th century.

Courtesy French & Co., Inc., New York

EUROPEAN TAPESTRIES II



English floral Tapestry
woven by Joshua Morris, early 18th century



Beauvais Tapestry,
"The Audience of the Prince," early 18th century

Courtesy French & Co., Inc., New York

or door which is intended to admit light and air. Wherever architecture advanced beyond the simplest structures of mud hut, igloo, or tent, windows became necessary to ventilate and lighten interior rooms. The Egyptians and their contemporaries used windows (at least in palaces and great houses) which were protected by wooden latticework and curtains. Their temples were lighted by clerestories, a form of window which was taken over into the first Christian basilicas. We also know of Roman and Greek windows covered with wooden, metal, or marble latticework. Roman bathhouses seem even to have had windows covered with pieces of a heavy opaque glass.

The importance of windows as an integral part of architecture rose with the advance made in the manufacture of glass. The stained-glass windows of medieval cathedrals, with their beautiful tracery and luminous glasswork, are unsurpassed. Private houses continued for a long time to have open windows (as was true all through antiquity and as is still the case in the Orient and poor sections of the American South), covered only by wooden or metal latticework, by curtains, skins, shutters, or (in winter) simply by boards nailed to the window frame. With the advent of cheaper glass, the movable frame or window sash became popular; thus we distinguish today the following classes of windows:

Hung windows: windows where one or two sashes are movable in a vertical direction (up and down). *Casement windows:* windows where the sash (here called the "casement") hangs on hinges fastened to the side of the frame, and moves in a horizontal (outward and inward) direction. Most windows belong to either of these two classes.

Other kinds and classes of windows (named according to their form, location, or function) are the following:

Basement window: a casement window which is not fastened by hinges to either side of a window frame, but either to the sill or to the head of the window frame. *Bay window:* a window enclosing a projecting architectural part, a semicircular bow, or a polygonal bay. *Bull's eye:* a round window; in the side of a ship, this is called a *porthole*. *Dormer:* a window set into a gable roof or projecting from it, with a little roof of its own (see *Skylight*). *French window:* a large casement window, frequently extending from floor to ceiling; this is really a glass door and consequently also is called a French door. *Glass-block window:* a window formed by glass blocks set in a wall; this cannot be opened. *Gliding window:* a form of window where the sashes glide horizontally (to the right or left) on tracks grooved into the sill. *Oriel window:* a bay or bow window in an upper story, supported by masonry, which may be two or more stories in height. *Picture window:* a window designed to provide the greatest possible view, extending nearly the full width of a room. *Fire window:* a window constructed of fire-resistant glass. *Skylight:* a roof window which, in contrast to the dormer, does not face outward (*i.e.,* parallel to the wall of the house) but upward (*i.e.,* at an angle to or parallel with the roof. *Storm window:* a window with two glass panes enclosing an air space between them to insulate and protect against cold. *Tilting window:* a casement window fastened with one hinge to each side of the frame and pivoting around that hinge in such a way that it can easily be tilted to a horizontal position. *Transom window:* a window set over a door or over another window.

Though the form of windows has become static, advances have been made in making window glass; there are now window glasses for varying purposes, such as to permit the passage of ultraviolet (sun) rays, to be splinterless when shattered (for auto and airplane windows), and to permit the observation of children or patients without allowing them to see their observers.

Windpipe (*wĭnd′pīp*) or TRACHEA. See *Lungs; Respiration.*

Wind River Range (*wĭnd rĭv′ẽr rānj*), a division of the Rocky Mts. in western Wyoming. It includes Gannett Peak (13,785 ft.), the highest point in the state. Other peaks in the range, which is part of the Continental Divide, include Fremont Peak (13,730 ft.), Mt. Helen (13,600 ft.), and Wind River Peak (13,500 ft.). The Green River, largest tributary of the Colorado River, rises in the Wind River Range.

Windsor (*wĭn′zẽr*), a city in Essex County, province of Ontario, Canada, situated on the Detroit River, opposite Detroit, Mich., with which it is linked by tunnel, bridge, and ferry. It is served by the Wabash, the Canadian National, the Michigan Central, the Canadian Pacific, and other railroads. The city is surrounded by a farming district specializing in tobacco and corn. There are large deposits of limestone, salt, and soda ash along the Detroit River. One of Canada's leading industrial cities, Windsor is one of its top producers of automobiles. It also has salt, chemical, and drug plants and distilleries. It is the seat of Assumption Coll. (built by the Jesuits in 1855).

The site was first settled in 1640 by the Jesuit Fathers Brébeuf and Charmonot. In 1701 fur traders began to establish themselves along the Detroit River; from these beginnings sprang the four municipalities now making up the city of Windsor. Windsor, Walkerville, East Windsor, and Sandwich merged in 1935 to form the incorporated city of Windsor. Population, 1956, 184,045 (with suburbs).

Windsor (*wĭn′zẹr*) or NEW WINDSOR, a municipal borough in Berkshire, England, situated on the river Thames *ca.* 22 m. w. of London. Its charter was granted as early as 1276, and its town hall was designed by Christopher Wren. It is chiefly important, however, as the site of Windsor Castle, for about 900 years the state residence of the British royal family.

Windsor castle crowns an isolated chalk hill which offers an unrivaled view of the Thames valley and many counties. Its history starts with William the Conqueror, whose love of hunting induced him to obtain the hill and a wide expanse of Windsor Forest. Edward III, with the famous William of Wykeham as architect, was responsible for the first real buildings, among them St. George's Chapel and Hall where the Knights of the Garter (the order was founded in Edward's reign) still hold their ceremonies. From the 14th century, the castle has been intimately connected with the family history of England's kings and queens. The original structure has been constantly repaired and rebuilt and by now has lost most of the appearance of antiquity, owing to extensive modernization under George IV. The Round Tower, in which many state prisoners were once confined, separates the so-called Lower and Upper Wards. The Lower Ward is dominated by St. George's Chapel, in the vaults of which lie buried many kings, including Henry IV, Henry VIII, George III, George IV, William IV, and Charles I. The Upper Ward is the royal residence. Although the private quarters are not open to the public, the State Apartments are. They house a priceless collection of art and historic treasures. There are gardens opening from the private residence, and beyond and around lie the Home Park, the Great Park, and Windsor Forest—in all, many miles of park land, with a famous double avenue and remarkably old trees.

Because of the centuries of association with Windsor, the reigning kings have chosen (1917) to be called the House of Windsor, George V being the first to be so named. Population, over 20,000.

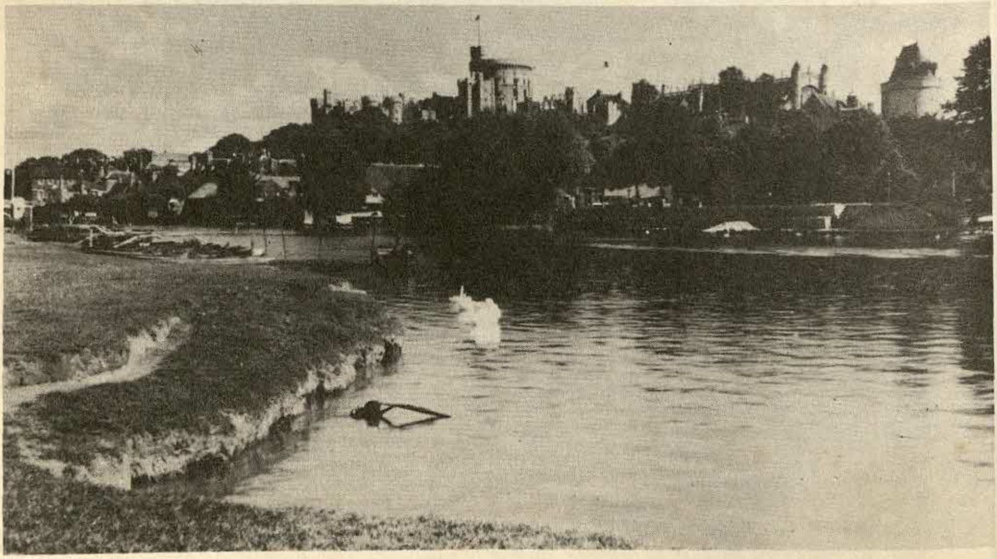
Windsor, DUKE OF. See *Edward VIII.*

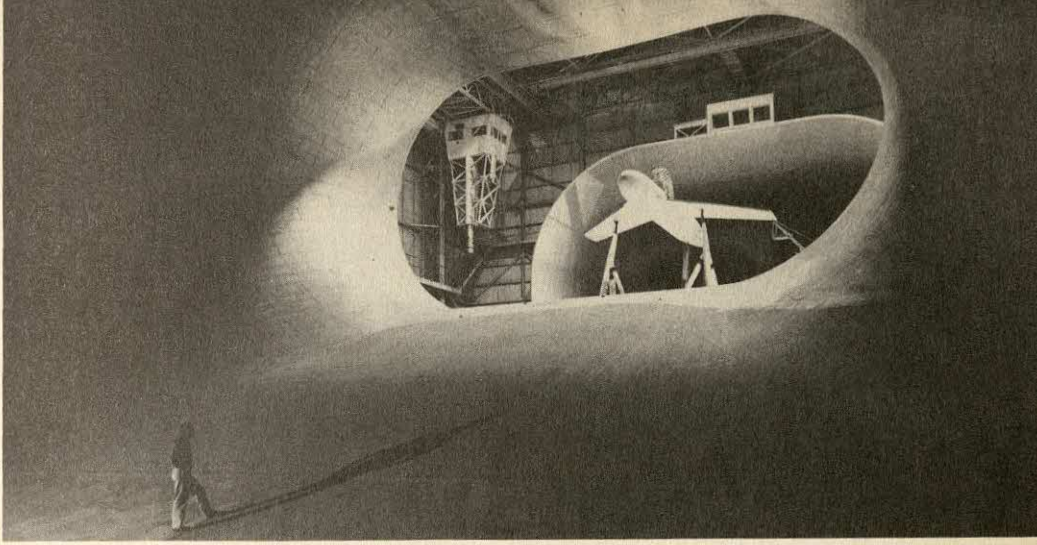
Windsor, HOUSE OF, since 1917 the title of the royal family of Great Britain (*q.v.*). See also *Windsor, England.*

Wind Tunnel (*wĭnd tŭn'ẹl*), an apparatus producing an artificial wind or air stream, in which objects are placed to study the air flow about them and the aerodynamic forces exerted on them. The wind tunnel provides a relatively safe and inexpensive means for determining, under controlled conditions, the behavior of an object immersed in an air stream. Early wind tunnels operated at relatively low velocities. In recent years wind tunnels have been developed that are capable of air speeds greatly in excess of the speed of sound (760 m.p.h. in air at sea level). Wind tunnels vary appreciably in size. Many of the very high-speed wind tunnels are capable of testing only small models. The largest wind tunnel in the U.S. has a test section 40 ft. high, 80 ft. wide, and 80 ft. long and is capable of testing a modern fighter aircraft at speeds up to 250 m.p.h. Fans or compressors commonly are used to provide continuous circulation of the air through the tunnel. A method frequently employed to establish very high-speed air flow consists of the discharge of air through the test section from high-

WINDSOR CASTLE

Courtesy Will F. Taylor





Courtesy National Bureau of Standards

WIND TUNNEL

pressure storage tanks. Wind tunnels are used most frequently to provide technical information relating to the design and operating characteristics of aircraft and missiles.

Windward Islands (*wĭnd'wẽrd ī'lạndz*), an island group of the Lesser Antilles, lying east of the Caribbean Sea and extending between the Leeward Islands and Trinidad. It includes the islands of St. Vincent, St. Lucia, Dominica, Grenada, and the smaller Grenadine Islands. The principal products include cocoa, nutmeg, coconuts, citrus fruits, bananas and other tropical fruits, copra, sugar, and cotton. Long under British influence, the islands in 1960 received ministerial government, with the Grenadine Islands administered half by Grenada and half by Dominica. From 1958 to 1962 the islands were a member of the West Indies Federation. The climate is moderate, but hurricanes are frequent, and rainfall is heavy. Population, 1960, *ca.* 300,000.

Wine (*wīn*), the pure, naturally fermented juice of fresh, ripe grapes. The fermented juice of certain other fruits is known as wine, but the term, as generally understood, applies to the product of the grape. Many widely different varieties of wine are produced; their peculiar qualities depend upon the soil, climate, and kind of grapes used. It is not known just when grapes were first cultivated for wine, but grapes were a part of the diet of prehistoric man, and, since the juice of crushed grapes naturally turns to wine, it is assumed that man drank wine before the dawn of history. Man's refinements in wine making are the cultivation of the grape, control of fermentation, care and sanitation in the winery, proper aging, and expert blending.

Many grape varieties existed centuries before the Christian era, but only one species was known to the people of the Near East and to the Europeans of the Middle Ages. This same grape, *Vitis vinifera*, the European wine grape, remains the mainstay of the world's wine trade.

Modern methods of production, especially in the U.S., insure the greatest care and cleanliness from the time the grapes are picked until the finished wine is bottled and set aside to complete its aging in the bottle. Basically there are only five classes of wine, easily distinguishable. These are *appetizer wines, white table wines, red table wines, sweet dessert wines,* and *sparkling wines.*

It is important to recognize clearly the legal difference between table and dessert wines, formerly known as "dry" and "sweet" wines. The word "dry" as applied to wine is the opposite of "sweet" and means free of sugar. For many years it was the custom to refer to any wine containing 14 per cent or less of alcohol as "dry," because most such wines have been fermented until the natural grape sugar has been converted to grape alcohol, and to refer to any wine between 14 and 21 per cent alcohol as "sweet," because most of such wines are sweet.

The use of the terms "dry" and "sweet" caused much confusion, because not all wines so classified were actually dry or sweet. Table wine is a better term because most wines of this class are used with meals, at the table. Dessert wine has a natural sweetness which makes it a perfect companion for the dessert usually served after a meal. Appetizer wine is wine of the dessert-wine class containing less sweetness, usually served before a meal; sherry and vermouth are examples.

Grapes ripen late in summer and in the fall, and the harvest or vintage begins when the grapes reach the required balance between natural grape sugar and fruit acid content. As quickly as possible after picking, which is done by skilled workers, grapes are delivered to the winery

Courtesy Caterpillar Tractor Co., Peoria, Ill.

CULTIVATION OF A CALIFORNIA VINEYARD

Courtesy Wine Institute, N. Y.

AUTUMN GRAPE HARVEST

Courtesy Wine Institute, N. Y.

WINE GRAPES BEING FED INTO A CRUSHER

Pictures courtesy Wine Institute, N. Y.

FERMENTATION TAKES PLACE IN LARGE VATS

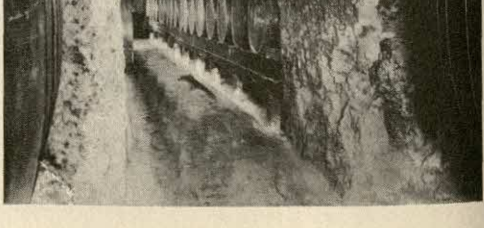
where they are carefully examined and weighed.

The first step in wine production is crushing, which is done by a modern crusher which first removes the grapes from their stems without breaking the seeds, and then breaks the skins, thus releasing the juice. From the crusher the juice and the skins and pulp of the grapes go to large fermenting vats, where the natural grape sugar is transformed into almost equal parts of alcohol and carbon dioxide gas by the action of yeasts.

Natural yeasts are found in the delicate, dust-like coating of the grapes, called the "bloom," although some vintners prefer to use their own, carefully cultured wine yeast. If a white wine is desired, the juice is drawn off from the grape solids immediately after crushing, but for red wine the fermentation proceeds with the full substance of the grape, the natural pigment in the skins giving the color.

After fermentation, which requires from a few hours to several days, according to a number of factors, the juice is drawn off and racked into storage vats or casks for aging. The remaining solids or "pomace" is placed in a grape press,

WINE IS AGED IN CASKS



where the remaining wine is squeezed out; this "press wine" is generally not considered as high in quality as the "free run" wine, or that which is drawn off from the solids without pressure.

Aging may require months or years, depending upon the type and the quality of the wine, the grapes from which it has been produced, and other factors. Wine literally changes from day to day, and careful supervision must be continued over the aging period to insure the best result. From time to time during aging the wine is "racked," that is, carefully drawn off the solids or "lees" which are slowly deposited, until at the last the wine is clear. This racking is done throughout the year, and is an important duty of the winemaker and his staff.

During aging the wine is periodically sampled, and careful laboratory tests as well as tasting check the quality. Upon such testing depends the decision as to the proper time for bottling, and a wine which is allowed to remain too long in the wood may lose much of its quality. Wine is the only beverage which improves in the bottle, and proper "bottle aging" is as important for wine as is the period in the cask.

Bottling today is handled by intricate machines, which pour the finished wine into sterile bottles, then cap or cork the containers, and affix labels. Bottled wine is laid away in cellars where constant checks are made to be sure the temperature remains constant; this storage or "binning" is concluded only when further analysis proves the wine at its peak of condition.

While it is true that in aging the wine develops smoothness, mellowness, and character, aging alone is no guarantee of quality, and different wines complete their aging in different periods of time. Because mere age is so unreliable as a guide to quality, labeling regulations do not permit age designations for wine.

In addition to the various steps given above, some wines may also be filtered and "fined" to clarify further the finished product. Filtering is accomplished by passing the wine through costly and spotlessly clean filters, while fining takes place when clarifying substances are added to the wine in the cask, the few remaining grape solids being carried to the bottom of the cask with the fining material. Another step in finishing some wines is storing the wine in cool rooms for various lengths of time, or cooling the wine itself by means of refrigerating equipment.

Blending is an important part of the winemaker's art, for the slight changes in the grape's character from year to year may thus be equalized, and a wine of unvarying taste and aroma be assured.

Winebrenner (*wīn'brĕn-ẽr*), JOHN, clergyman, born in Frederick County, Maryland, Mar. 24, 1797; died in Harrisburg, Pa., Sept. 12, 1860. He was graduated from Dickinson Coll., studied theology in Philadelphia, and became pastor of the German Reformed Church in Harrisburg, Pa. He left that sect and organized the Church of God (1830), whose chief tenets are the washing of feet, baptism by immersion, and partaking of the Lord's Supper. This sect is most strongly represented in the Eastern and Middle states. It has, however, since expanded into various sub-divisions, totaling some 635,000 communicants. The chief printing office is at Harrisburg, Pa. Winebrenner published "Brief Views of the Church of God," "History of All the Religious Denominations in the U.S.," "Revival Hymn Book," and "Treatise on Regeneration."

Winfield (*wĭn'fēld*), county seat of Cowley County, Kansas, located 15 m. N. of the Oklahoma border and 50 m. S.E. of Wichita. Railroads serving the city are the Missouri Pacific, the St. Louis & San Francisco, and the Atchison, Topeka & Santa Fe. Located in Winfield are St. John's Coll. (Lutheran) and Southwestern Coll. (Methodist). Principal products manufactured are gas burners, alfalfa meal, limestone fertilizer, crayons, ceramic tile, cosmetics, and processed farm products. Oil is produced near the city, which was incorporated in 1873. Population, 1950, 10,264.

Wingate (*wĭn'gât*), ORDE CHARLES, army officer, born Feb. 26, 1903, in the Himalayas; died in Burma, Mar. 24, 1944. The son of an army officer, he was educated in England at Woolwich Military Acad., becoming a second lieutenant in 1923. From 1936-39 he commanded troops in Palestine and Transjordan against Arab terrorist bands in the region of the Haifa-Mosul pipeline. In 1941, he marched into Addis Ababa with Haile Selassie, after having organized an Ethiopian patriot revolt and with a few thousand men killed or captured 40,000 Italian troops. In 1942 Gen. Wavell called him to India to organize a force to fight the Japanese in Burma. Wingate's methods were unorthodox but effective. His men, who soon became known as "Wingate's Raiders," were given special training in jungle fighting. Once they went into action, Wingate commanded them by radio and all supplies were dropped to them from airplanes. In 1944 Wingate was chosen to head the first airborne operation in the Southeast Asia theater. His raiders were flown in gliders by U.S. pilots to a point 150 m. behind the Japanese lines in Burma, where they built an air strip and were successful in cutting the vital Mandalay-Myitkyina railroad line in two places. Only a few days after this operation was successfully completed, Wingate was killed in an airplane crash. In addition to training his own raiders, Wingate was also in charge of training the U.S. troops who later became known as "Merrill's Marauders."

Winged Lion (*wĭngd lī'ŭn*), an emblem of St. Mark, the patron saint of Venice, Italy. It is situated on one of the columns of the Piazzetta at Venice and is constructed entirely of bronze. Napoleon carried it to Paris in 1797, but it was restored to Venice in 1815.

Winged Victory (*wĭngd vĭk'tô-rȳ*), a famous marble statue of the goddess Nike (Greek, meaning victory), discovered on the Greek island of Samothrace in 1863, now in the Louvre, Paris. The figure, part of a monument which has not been found, celebrates the Greek naval victory at Salamis in 306 B.C. over the fleet of Ptolemy of Egypt. Probably created between 230 and 200 B.C., it is characteristic of the sculpture of the early Hellenistic period. The naturalism of the flying material of the clothes pressed against the clearly visible body of the Victory is one of the most beautiful examples of the typical Greek faculty for combining realism and idealism. In 1950, the right hand of the sculpture was discovered near its original location. From the position of the open hand it can be assumed that the figure held a wreath or fillet.

Another "Winged Victory" was unearthed on Samothrace in 1949. Less grand in scale and more quiet in pose, this sculpture has been dated about 250 B.C. See also *Nike*.

Wingfield (*wĭng'fēld*), EDWARD MARIA, British adventurer, born at Stoneley, Huntingdonshire, England, *ca.* 1560; died *ca.* 1613. One of a family which had produced several public officials, he became a soldier in his youth, and later became interested in the colonization of America; he was among the adventurers to whom the first Virginia charter was granted in April 1606. He sailed with the original settlers, arriving in April 1607, and shortly afterward was chosen as first president of the colony. During the summer the colonists were weakened by illness and disorganized. Blaming him for their hardships, they charged that he planned to desert them and that he lived in style while they suffered from want of food. He was removed from office in September 1607, imprisoned, and the next spring was sent back to England. Denying the accusations, he wrote his defense, "A Discourse of Virginia." It contained recommendations which are believed to have been useful in the reorganization of the Virginia colony. In a second charter in 1609 he was named a grantee. He did not return to America but lived at Stoneley until his death. His "Discourse," unpublished until 1860, presented a different and, according to some historians, a more accurate picture of early colonial life than that given by John Smith.

Winkelried (*vĭng'kel-rēt*), ARNOLD VON. See *Arnold von Winkelried*.

Winnebago (*wĭn-ē-bā'gō*), the largest lake of Wisconsin, in Winnebago County, 40 m. w. of Lake Michigan. It receives the water from the Fox and Wolf Rivers and the overflow from Lake Poygan. The length is about 30 m., the greatest width is 10 m., and the area is 218 sq. m. It discharges through the Fox River into Green Bay. The Fox River is navigable, making the lake of value for transportation. It has fine fisheries. On its shores are the cities of Menasha, Fond du Lac, and Oshkosh.

Winnebagoes (*wĭn-ē-bā'gōz*), an Indian tribe of the Dakota family, first met with by French traders in the Green Bay region of Wisconsin in the early 17th century. Formerly a powerful tribe of Siouan stock, they had vigorously opposed the Algonquins, but were greatly reduced in number when the French explorer Jean Nicolet arrived (1634). In the French and Indian War they sided with the French, but joined the British against the colonies in the Revolution. Gen. Wayne subdued them in 1793 and 1794. They sided against the Americans in the War of 1812. Subsequently they joined the alliance under Tecumseh. In 1829 they ceded large tracts of land and in 1866 they accepted certain lands in the vicinity of Winnebago, Neb. Several Protestant and Catholic missions and a number of schools have been conducted among them, and education and advancement in civil arts have be-

WINGED VICTORY

come general. At present they number about 2,000.

Winnepesaukee (*wĭn-ẹ-pẹ-sạ'ḳê*) or WINNIPESAUKEE, a lake in New Hampshire, lying between Belknap and Carroll counties, 25 m. N.E. of Concord. It is 25 m. long and from 4 m. to 10 m. wide; the area is 71 sq. m. It is located 470 ft. above sea level. The lake's shores are more or less abrupt and indented by deep bays. It has excellent fisheries and the fine scenery and numerous islands make it a favorite summer resort. The overflow is discharged by the Winnepesaukee River, which unites with the Pemigewasset River to form the Merrimack.

Winnipeg (*wĭn'ĭ-pĕg*), a lake of Canada, lying in Manitoba, Kewatin, and Saskatchewan. The length is 275 m., the width is from 40 to 62 m., and the area is about 8,940 sq. m. A basin of 395,000 sq. m. drains into it. The surface is 710 ft. above the level of the sea. It receives the water from the Red River of the North, the Assiniboine, and the Saskatchewan Rivers and its overflow passes by the Nelson into Hudson Bay. Lake Winnipeg receives the discharge from the Lake of the Woods by the Winnipeg River, a stream about 290 m. long. It has excellent fisheries, but navigation is obstructed by ice about six months of the year.

Winnipeg, capital of the province of Manitoba, Canada, *ca.* 1,400 m. from Montreal and 512 m. N.N.W. of Minneapolis. Situated at the junction of the Assiniboine with the Red River through which it has access to Lake Winnipeg, it is the center of considerable trade and industry. The city is served by the Canadian Pacific, the Canadian National, the Northern Pacific, and the Great Northern R.R.'s, as well as by an airport. It is surrounded by a fertile agricultural region and has the second largest fur market in Canada. An expanding manufacturing center, Winnipeg has a large trade in lumber, livestock, and hides, and is the greatest grain-exporting market in the British Empire. The principal industries include meat packing, flour and feed, dairy products, chemicals, clothing, bags, cotton and jute, printing and publishing, breweries, iron and steel, textiles, wood and paper products, and food products. Aircraft, machinery, sheet-metal products, iron castings, and house furnishings are also important manufactures.

Notable buildings in Winnipeg include the Provincial and Dominion offices, the city hall, the custom house, the Royal Alexandra and Ft. Garry hotels, the conservatory, the Palm House, the art gallery, and a museum housing a collection of wild animals and birds. The schools include Ruperts Land Girls' School, Riverbend School for Girls, St. Mary's Acad. for Girls, United Coll., St. Boniface Coll., Manitoba Medical Coll., and the Univ. of Manitoba. St. Boniface, a town on the east bank of the Red River, with large stockyards, is connected with Winnipeg by a number of bridges.

Before 1873 Winnipeg was known as Ft. Garry, when it was an important trading post of the Hudson's Bay Co. A band of insurgents under Louis Riel had taken possession of Ft. Garry early in 1870, and G.I. Wolseley was dispatched

Courtesy Manitoba Govt. Travel & Publicity Bureau

WINNIPEG. ASSINIBOINE PARK

with a military force to dispossess them. At that time the community consisted of about 200 people, the nucleus from which the present metropolis grew. Soon afterward railroad communication was established through Minnesota, and the completion of the Canadian Pacific R.R. in 1881 contributed to the city's rapid growth. Agricultural development in Manitoba and the country to the west gave the city a tremendous impetus. The city was incorporated in 1873 with 1,869 inhabitants. Population, 1951, 235,710.

Winnipegoosis (*wĭn-ĭ-pē-gōō'sĭs*), or WINNIPEGOOS, a lake in the provinces of Manitoba and Saskatchewan, Canada, lying west of Lake Winnipeg. The length from north to south is 128 m. and the width is from 12 to 24 m. It has an area of 7,985 sq. m. The shores are indented by numerous bays. South of it is Lake Manitoba, into which it discharges by the Waterhen River. It receives the water from Swan and Red Deer Rivers. The overflow, after reaching Lake Manitoba, is discharged by the Dauphin River and St. Martins Lake into Lake Winnipeg, whence it passes into Hudson Bay by the Nelson River. In the vicinity are fine forests.

Winona (*wĭ-nō'nȧ*), county seat of Winona County, Minnesota, approximately 102 m. S.E. of St. Paul. It is situated in the valley of the Mississippi and is served by the Burlington, the Chicago & North Western, the Chicago Great Western, the Chicago, Milwaukee, St. Paul & Pacific, and Green Bay & Western R.R.'s, as well as by an airport, and barge line service. Once an important lumbering town, it is now a thriving industrial city having about 80 diversified industries, and numerous wholesale and retail establishments. An educational center, Winona has a state teachers college, St. Mary's Coll. for men, the Coll. of St. Teresa for women, and two business colleges. Sugar Loaf Mt. is located near Lake Winona, the largest of Minnesota's many lakes. The town was incorporated in 1857. Population, 1950, 25,031; in 1960, 24,895.

Winslow (*wĭnz'lō*), EDWARD, governor of Plymouth Colony, born in Droitwich, England, Oct. 19, 1595; died May 8, 1665. Religious persecutions in England caused him to seek a refuge in Holland, where he became a member of Robinson's church at Leyden, and in 1620 came to New England in the *Mayflower*. His wife died shortly after reaching Plymouth, and he afterward contracted the first marriage in the Plymouth Colony by wedding Mrs. Susanna White. He won the friendship of Massasoit, the Indian chief, while treating him in a case of sickness, and afterward made several voyages to England for the colony. In 1624 he became a magistrate and was chosen governor in 1633, 1636, and 1644. He represented his colony in the New England Confederation. Cromwell appointed him head commissioner of an expedition against the Spanish West Indies, but he died while on the voyage. Winslow wrote several religious works and a history entitled "Good News from New England."

EDWARD WINSLOW

Winslow, JOHN ANCRUM, naval officer, born in Wilmington, N.C., Nov. 19, 1811; died in Boston, Mass., Sept. 29, 1873. In 1827 he became a midshipman in the navy, was made lieutenant in 1839, and for gallant service in the Mexican War became commander of the schooner *Morris*. He was made a commander in 1855 and became captain in 1862. In 1863 he was given command of the *Kearsarge*. On June 19, 1864, he attacked the privateer *Alabama* off Cherbourg, France, and after an engagement of an hour shattered and sank that vessel. He commanded the Gulf squadron from 1866-67 and in 1870 became rear admiral. In the latter year he was made commander of the Pacific squadron, but retired from active service the following year.

Winsor (*wĭn'zẽr*), JUSTIN, librarian and author, born in Boston, Mass., Jan. 2, 1831; died Oct. 22, 1897. After studying at Harvard Univ., he pursued courses in Paris and at Heidelberg, Germany. He became superintendent of the public library of Boston in 1868, and in 1877 was made librarian of Harvard. In 1876 he was elected first president of the American Library Association. His books include: "Christopher Columbus," "The Mississippi Basin," "Bibliography of Original Quartos and Folios of Shakespeare," "Life and Times of David Garrick," "From Cartier to Frontenac," and "Narrative and Critical History of the U.S."

Winston-Salem (*wĭn'stŭn-sā'lĕm*), a city in northwestern North Carolina, seat of Forsyth County, 25 m. W. of Greensboro. It is served by the Norfolk & Western Ry. and the Southern Ry. Smith Reynolds Airport is 5 m. N. of the city. Situated on the Piedmont plateau, Winston-

Salem has an extensive park system, including Tanglewood and Reynolds parks and Reynolda Gardens, famous for its cherry trees. Long known as a cultural center, the city is the seat of Salem Acad. and Coll., Bowman Gray School of Medicine, Winston-Salem Teachers Coll., and Wake Forest Coll., which moved to a new 300-acre campus here in 1956. Cultural facilities include the Winston-Salem Gallery of Fine Arts and the units of the Arts Council. Old Salem is the site of some 40 historic buildings dating to the 18th-century settlement.

Primarily an industrial center, Winston-Salem is one of the largest tobacco manufacturing cities in the world. Other products include furniture, textiles, and electronic equipment. In addition to tobacco, the surrounding area produces large quantities of livestock and poultry. In 1958 the city had a value added by manufacture of $412,-894,000. It is the center of the Winston-Salem Standard Metropolitan Statistical Area (1960 pop., 189,428), which includes all of Forsyth County.

Winston-Salem is a consolidation of two cities —Salem, founded in 1766 by the Moravians, a Protestant sect of Bohemian origin, and Winston, founded in 1850. The two cities were incorporated as one in 1913. Winston-Salem's decade of greatest growth was from 1920, when the population was 48,395, to 1930, when it was 75,274. In 1950 the population was 87,811; in 1960, 111,135.

Courtesy Winston-Salem Chamber of Commerce, N. C.

THE OLD COFFEE POT IN WINSTON-SALEM

Erected in 1857 as a tinsmith's sign

Winter (*wĭn'tẽr*), the coldest season of the year, following autumn and preceding spring. It begins astronomically, in the Northern Hemisphere, on the shortest day, Dec. 21, and ends with the vernal equinox, Mar. 21. In popular use the name winter is applied to the three coldest months, which are November, December, and January in Great Britain and December, January, and February in Canada and the U.S. In the tropical zone the rainy season is termed winter. The winter months of the Southern Hemisphere are June, July, and August.

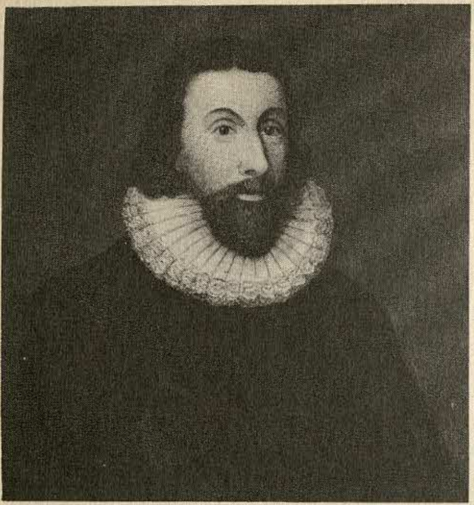
Winter, WILLIAM, poet and critic, born in Gloucester, Mass., July 15, 1836; died June 30, 1917. He studied in Boston, took a course at the Harvard Law School, and became a contributor to the Boston *Transcript.* Subsequently he moved to New York, where he wrote for six years as an editor of the *Saturday Press,* and in 1865 became literary critic of the New York *Weekly Review.* He visited Europe in 1877 and on returning to America published "Trip to England." Among his best works are: "Old Shrines and Ivy," "Life of Henry Irving,". "Shadows of the Stage," "Stage Life of Mary Anderson," "My Witness," and "Sketches of Scotland."

Winter Aconite (*wĭn'tẽr ăk'ō-nīt*), a perennial herb of the Old World, cultivated for its bright yellow flowers which often appear on snow-covered ground.

Winterberry (*wĭn'tẽr-bĕr-ĭ*). See *Inkberry.*

Wintergreen (*wĭn'tẽr-grēn*), the name of several species of plants of the heath family, which are mostly native to the Northern Hemisphere. They are perennial herbs and grow as half-shrubby plants in low woods. The *checkerberry,* whose aromatic leaves yield the oil of wintergreen, is a noteworthy American species. It has slender stems, which creep along the surface of the ground, and the ascending flowers are followed by red berries. It is sometimes called *partridge berry, creeping wintergreen, mountain tea,* and *boxberry.* The *flowering wintergreen* is another familiar species of North America, having short, erect stems and conspicuous rose flowers. The *spotted wintergreen* is common in the dry woods from Georgia to New Brunswick.

Winthrop (*wĭn'thrŭp*), a town in Suffolk County, Massachusetts, 5 m. N.E. of Boston, on Massachusetts Bay. The city is served by bus lines which connect with the Boston Elevated system at East Boston. It is popular as a summer resort and residential center. The chief buildings include the house of Deane Winthrop, which was built in 1649. The Winthrop Shore Reservation and Ingalls Park are also notable. Fort Banks was formerly located here. Winthrop was settled in 1634 and named for Gov. John Winthrop (*q.v.*). It was separated from North Chelsea and incorporated in 1852. Population, 1950, 19,496.



JOHN WINTHROP

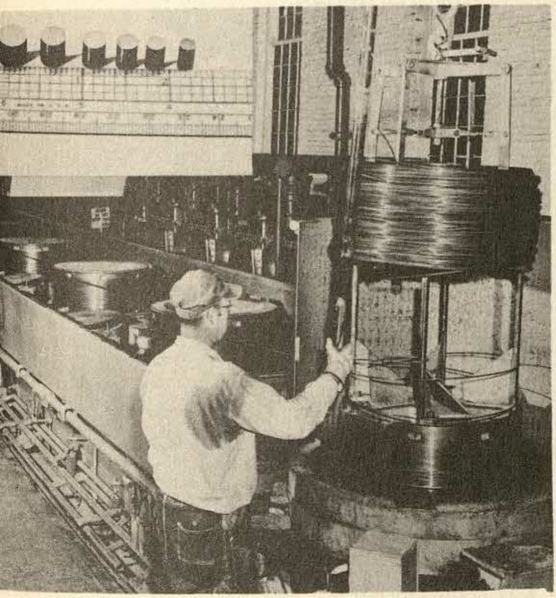
Winthrop, JOHN, first governor of Connecticut, born Feb. 12, 1606, in Groton, Suffolk, England; died Apr. 5, 1676, in Boston, Mass. He was the first son of the John Winthrop who later became first governor of the Massachusetts Bay Colony. Young Winthrop was educated at Trinity Coll., Dublin, later studying law and gaining admission to the Inner Temple in 1625. He determined to go to New England when his father made the decision to emigrate, but remained behind to settle the family's affairs and did not actually arrive in Boston until 1631. The following year he was elected an assistant and the year after that leader of a group of men who founded Ipswich. In 1634, during a visit to England, he so impressed a group of his father's friends that they determined to make him governor of a plantation they were planning to start in Connectitcut. He served as governor of Connecticut in 1636, although living in Massachusetts during his entire term. Afterward he devoted himself for some years to the management of some iron works he had founded, but in 1650 he established a permanent residence in New London, Conn., which he had founded, and again entered public life as a magistrate in 1651. In 1657 he was elected governor of the colony, in 1658 lieutenant governor, and from 1659 until his death was annually re-elected governor. As governor he obtained for Connecticut an exceptionally liberal charter from the crown, a charter which made the separate colonies of Connecticut and New Haven into a single, almost independent, colony. In 1663 he became the first resident American to win election to the Royal Society. He was named a commissioner of the United Colonies of New England.

Winthrop, ROBERT CHARLES, politician, born in Boston, Mass., May 12, 1809; died Nov. 16, 1894. He was descended from John Winthrop, the first governor of Massachusetts. In 1828 he was graduated from Harvard Univ., studied law with Daniel Webster, and was elected to the legislature as a Whig in 1834. He was elected to Congress in 1840, serving for 10 years, and as speaker of that body from 1847-49. In 1850 he succeeded Daniel Webster as U.S. Senator, but Charles Sumner defeated him when he was a candidate for re-election in 1851. He was strenuously opposed to slavery and the Mexican War and favored the compromise measures in 1850. Much of his time after 1851 was spent in the study of historical literature.

Winthrop, THEODORE, author, born in New Haven, Conn., Sept. 22, 1828; died in battle, June 10, 1861. He was descended from John Winthrop, was graduated from Yale Univ. in 1848, and spent two years in European travel. He was later employed by the Pacific Mail Steamship Co. In 1853 he aided in surveying a canal across the Isthmus of Panama. He was admitted to the bar in 1855 and opened a law office in St. Louis, where he gave much attention to literary work. At the beginning of the Civil War he joined a New York regiment and became military secretary to Gen. Butler with the rank of major. He was killed in action at Big Bethel, Virginia. His writings include: "Life in the Open Air," "Love and Skates," "Cecil Dreeme," "The Canoe and the Saddle," and "Edwin Brothertoft."

Wire (*wīr*), a long, thin section of metal having a uniform cross section which is usually oval or round. Wire is of exceptional importance as a structural material, an electrical conductor, and a special device for the production of light and/or heat from electricity. It is known and used today in a variety of compositions and shapes. Chemically, a wire may be composed of iron, steel, copper, brass, alloys such as nichrome (nickel and chromium), or tungsten. The greatest tonnage of wire is produced today from mild steel, with copper wire next and the other kinds in smaller amounts. These varieties of wire are produced by modifications of a common "drawing" process which is described below for wrought iron or mild steel.

The wire-drawing machine consists essentially of a *drawing plate* holding a *die* (small hole of specific size and shape) through which the wire is drawn by a power-driven drum on which the wire is wound after drawing. The raw material of which the wire is made is known as rolled rod, which may be square, round, or oval in cross section, about 1/5 in. in cross section and about ¼ m. long. It is wound on a spool, and on passing through the die, undergoes great elongation and reduction in diameter. In order for the process to operate smoothly and produce a good quality of product the superficial coating of mill scale (a mixture of ferrous oxide and ferric oxides, $FeO.Fe_2O_3$) must be removed, and the clean surface be coated and lubricated before passing through the die. The scale is usually removed (pickled) with a dilute solution of sulfuric or hydrochloric acid; the wire is then washed thoroughly with water, coated with lime, and baked until dry. The end of the rod is swaged (pointed) until it will pass through the die and the operation is started. In the *dry process* the lubricant is a convenient grease or soap. Several drawing operations are required to produce small diameters of wire. After three or four drawings an undesirable hardness is produced in the wire presumably by the tremendous pressure (150 tons per sq. in.) to which it is subjected as it passes through the die. This is removed by annealing (keeping at a higher temperature and cooling slowly) between drawing operations. The dies are made of a very hard alloy for larger wires, and of pierced diamonds or rubies (of no value as jewels) for the smaller diameters. They wear away easily and require frequent replacement.



Courtesy American Steel & Wire Division of U.S. Steel Corp.

WIRE-DRAWING MACHINE

In this modern device, five rotating blocks continuously draw the wire through a die, accomplishing the reduction as shown in the inset at the top of the illustration. The machine is capable of drawing 20,000 lb. of wire in eight hours

In the *wet process,* after the pickling operation is completed, the rolled rod is passed through a special solution of copper sulfate and a thin coat of metallic copper is deposited on the steel. The rod is drawn through a soapy solution and on through the die. This process of coating a hard metal with a soft one before drawing was invented by Woolaston in the early 19th century.

The softer metals such as copper, silver, and brass are drawn in a similar way with appropriate modifications of pickling and coating, while hard metals like tungsten require a different approach. Tungsten is prepared by reduction of the oxide to give a powder. This is never melted, but is heated, hammered, and worked until it can be drawn. The drawing operation is carried out at a very high temperature; the coating and lubricant is graphite, and the die is made of tungsten carbide which is not very durable.

Wire has a variety of uses: Steel wire of high carbon content, and requiring special care in drawing, has very high tensile strength and is used for wire cables, rope, chains, piano wire, springs, and similar uses. Wire of low carbon content is used for wire cloth (screen wire), nails, bale ties, staples, barbed-wire fencing, wire netting, and other purposes. Copper wire is employed as a conductor for electric current, and special resistance wires (nichrome, constontan), are used for heating elements in electrical appliances. Tungsten is used exclusively in filaments for incandescent lamps, while other special compositions are used in wires employed in surgery.

Wireless Telegraphy (*wīr′lĕs tĕl-ĕg′rȧ-fȳ*). See *Radio.*

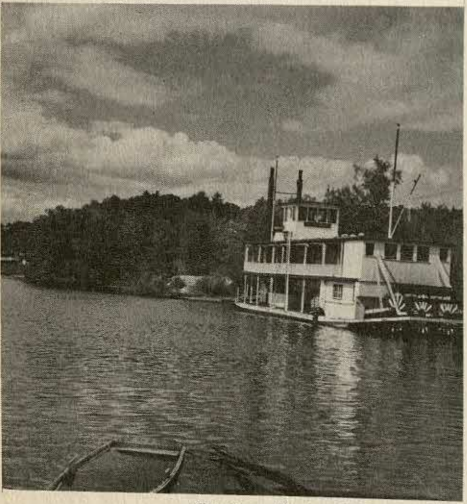
Wireworm (*wīr′wûrm*), a name applied to the larvae of various beetles, but especially to several species of elaters. The beetles of these larvae are generally known under the names of *click beetles* and *spring beetles.* While in the larval state they feed upon the roots of living plants, to many of which they are injurious. The worms attain maturity in a period of one to five years, during which time they undergo many molts. In some places wireworms are harmful to wheat and corn. See also *Click Beetle.*

Wirt (*wûrt*), WILLIAM, jurist and author, born in Bladensburg, Md., Nov. 8, 1772; died in Washington, D.C., Feb. 18, 1834. He studied law and practiced in a number of Virginia cities during his lifetime. He served in the Virginia house of delegates and then was appointed a U.S. district attorney by President James Madison. Madison's successor, Monroe, named him Attorney General of the U.S., a position he held during Monroe's two terms and under John Quincy Adams (1817-29). Wirt delivered able arguments in prosecuting the trial of Aaron Burr and later, when he was Attorney General, in the case of McCullough *vs.* Maryland and the Dartmouth Coll. Case. In 1832, he was a candidate for the U.S. Presidency on the Anti-Masonic ticket. His writings include: "The Letters of the British Spy," "Sketches of the Life and Character of Patrick Henry," "Addresses on the Triumph of

Liberty in France" and "The Rainbow."

Wirt, WILLIAM ALBERT, educator, born in Markle, Ind., Jan. 21, 1874; died in Gary, Ind., March 11, 1938. He was educated at De Pauw Univ. As superintendent of schools in Bluffton, Ind. (1899-1907), and Gary (1907 *et seq.*), he introduced the platoon system, now called the Gary Plan (see *Gary, Indiana*). In 1914 he was engaged as adviser to the New York City Board of Education to test his plan, which was adopted for a short time but later dropped.

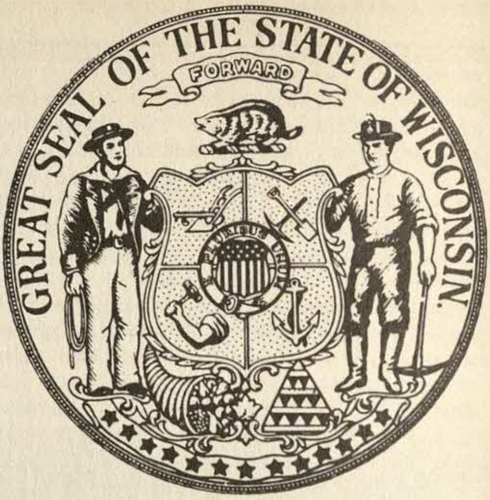
Wisconsin (*wĭs-kŏn′s′n*), a river in Wisconsin, the largest in the state. It rises in the northern part of the state and after a generally southern and later southwestern course of 430 m., it flows into the Mississippi 3 m. s. of Prairie du Chien. It is navigable to Portage, Wis., where the Portage Canal connects it with the Fox River, providing a continuous waterway across the state from the Mississippi River to Lake Michigan. The river, famous for its dells (see *Dalles*), drains an area of *ca.* 12,000 sq. m. Among the cities on its banks are—from north to south—Rhinelander, Merrill, Wausau, Stevens Point, Wisconsin Rapids, Wisconsin Dells, and Portage.



Courtesy Ewing Galloway, N.Y.

A STERN WHEELER ON THE WISCONSIN

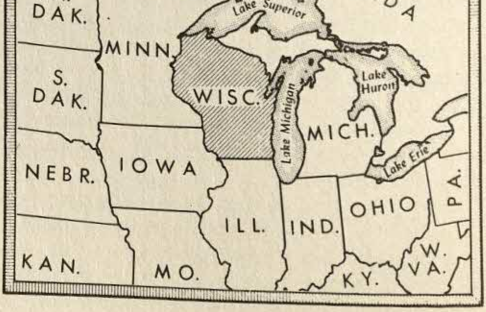
Wisconsin, a state in the East North Central section of the U.S., known widely as America's dairyland. It is also an important agricultural and manufacturing state and a famous vacation land. Wisconsin is bounded on the N. by Lake Superior and Michigan, on the E. by Lake Michigan, on the S. by Illinois, and on the W. by Iowa and Minnesota (part of this border is formed by the Mississippi River). It ranks 26th in size among the states and 14th in population, according to the 1958 estimates of civilian population (Alaska, Hawaii, and the District of Columbia included in both rankings). The state's name comes from a Chippewa Indian word meaning "the gathering of the waters." The state's nickname is the "Badger State," for the burrowing activities of early miners in the lead region.


GREAT SEAL OF THE STATE OF WISCONSIN.
FORWARD
E PLURIBUS UNUM

GEOGRAPHY

Glacial ice sheets which once moved over all but the southwest corner of Wisconsin have determined the nature of the state's topography and soil composition. These heavy masses leveled the hills, filled in the valleys, and ground up some of the soil, leaving behind deposits of sand and gravel. The thousands of glacier-created lakes which occur in all but the southwest area not only enhance the state's beauty but prevent floods by regulating the flow of rivers and streams.

Most of northern Wisconsin is a gently rolling region, once densely timbered but now cut over or burned over and dotted with scrub or planted with a second growth of trees. Altitudes range from 900 ft. to 1,951 ft. at Sugarbush Hill, the state's highest point. The Chippewa, Flambeau, and St. Croix rivers rise in these northern up-



Location	Between 86°49′ and 92°54′ W. long. and 42°30′ and 47°3′ N. lat.
Area	56,154 sq. m.
Land	54,715 sq. m.
Inland water	1,439 sq. m.[1]
Greatest extent:	
North to south	300 m.
East to west	260 m.
Population (1950)	3,434,575
Capital city	Madison
Highest point	Sugarbush Hill (1,951 ft.)
Lowest point	Lake Michigan (581 ft.)
Admitted to the union (30th state)	1848
Song	"On Wisconsin," words by Carl Beck, music by W. T. Purdy
Flower	Wood violet
Bird	Robin
Motto	"Forward"
Flag	See color plate in Vol. XI

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[1] Including parts of the Great Lakes, the water area is 11,501 sq. m., bringing the total area to 66,216 sq. m.

lands and flow southwest to the Mississippi. The St. Croix forms the border between northwest Wisconsin and Minnesota. Before 1905, the St. Croix and Chippewa valleys were the most active logging and milling areas in the U.S. The Wisconsin River, the longest of the state's many rivers, rises in the northern uplands, in the Lac Vieux desert on the Michigan border, emptying into the Mississippi near Prairie du Chien. The 50 dams and powerhouses at points along its course make this one of the most productive and best-harnessed streams in the U.S. In the valley drained by the Wisconsin, dairying preserves the pastures that give the state its pastoral aspect. Of the many rivers flowing into Green Bay and Lake Michigan, the Fox is the longest and most important. Near its source, in south central Wisconsin, it is within *ca.* 2 m. of the Wisconsin River, with which it is connected by a canal, thus providing a link between Lake Michigan and the Mississippi. On its course, the Fox traverses Lake Winnebago, the state's largest lake. Much of the border between Michigan and Wisconsin is formed by the Menominee River.

The western upland is a plateau between the Wisconsin and Mississippi rivers, not exceeding 1,200 ft. in elevation, broken by rivers and their tributaries into a series of ridges and coulees. Along the Mississippi and the Wisconsin are heavily wooded bluffs, often topped by limestone cliffs. In the southwest the so-called driftless area was untouched by glaciers and is more rugged than the central plain. Its prairies and broad wooded ridges, with deep layers of limestone soil, provide good farm land for growing spring wheat, corn, and potatoes. Isolated hills and ridges of older rock, such as the Platte Mounds and Blue Mounds, interrupt the prairie. These two elevations, about 50 m. apart, are visible for many miles.

Southeastern Wisconsin is rolling terrain with a mixture of prairies, groves, forests, and lakes. Beeches and maples prevail in the high land; marsh conifers are found on the lower levels. The soil is generally rich, and the counties in this area are among the most prosperous and productive in the state. The southeast also has three of the state's five important ports (Milwaukee, Racine, and Kenosha), and the greater part of its industry and commerce are centered here.

In the south central area the four-lakes region around Madison presents a pleasing aspect of lake shores fringed with docks and boats and flanked by thick groves of trees. The area is reminiscent of English park scenery. In winter sportsmen fish for perch through the thick ice of Lake Mendota, and ice boats have reached record speeds of 140 m.p.h.

ANNUAL STATE EVENTS

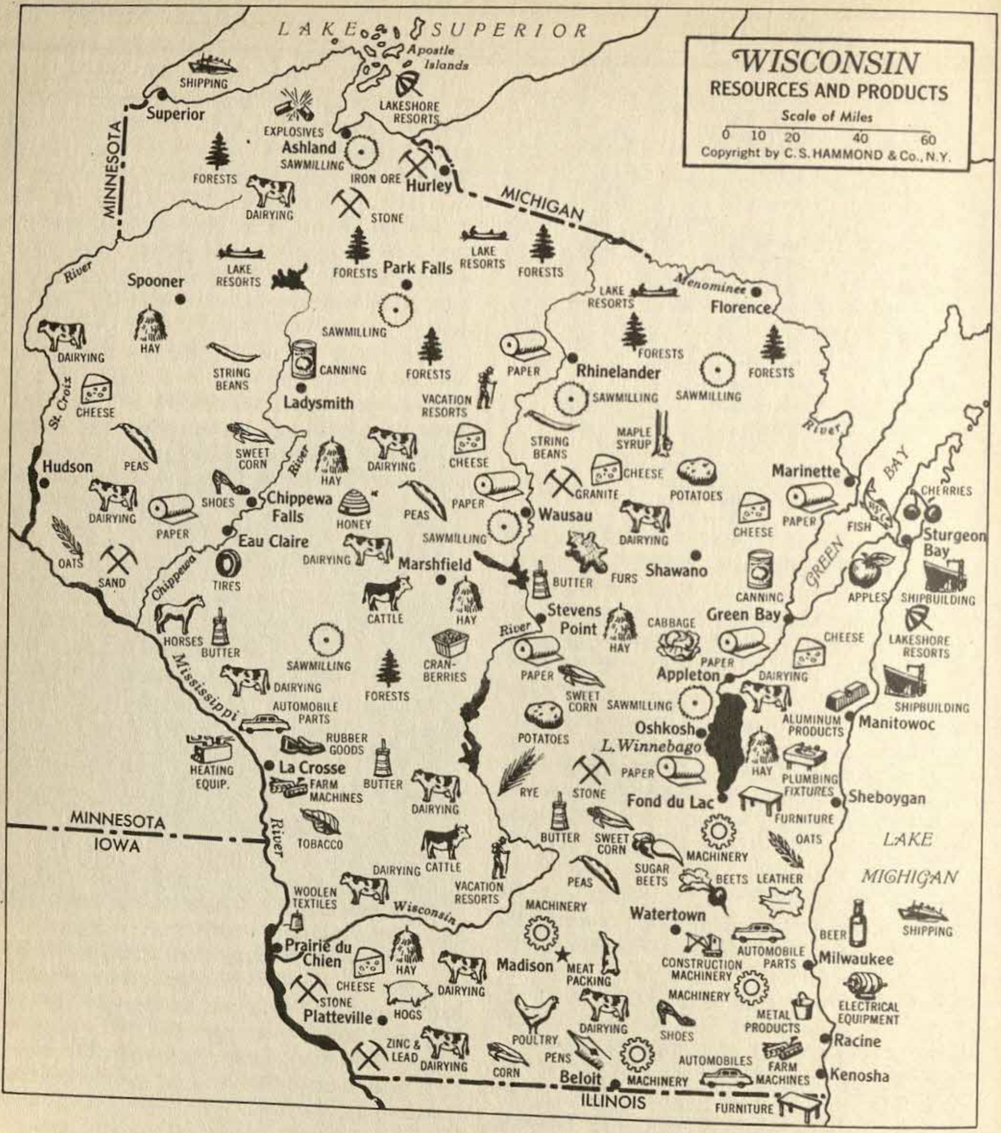
Stand Rock Indian Ceremonial	July through Labor Day; Stand Rock, Upper Dells; colorful dances and ceremonies in natural amphitheater
Scandinavian Folk Festival	Second week in July; Washington Island in Lake Michigan
State Fair	August; Milwaukee
Peninsula Music Festival	Mid-August; Fish Creek
Swiss Festival	Labor Day week end; New Glarus; dramatization of the William Tell story
Holiday Folk Fair	Early winter; Milwaukee; ethnic celebration, folk dancing, singing, athletic events

Climate: Wisconsin's climate varies from north to south but is generally dry. Winters are long and severe, especially in the northwest and central sections, which are affected by cold fronts moving east and south across the Canadian border, and snowfalls are frequent and heavy. Hot spells are common, especially in the Mississippi Valley, where humidity is high. The entire state is in a favorable belt for rainfall, which is quite evenly distributed.

Normal temperature, Milwaukee	
January	23.0° F.
July	72.3° F.
Annual mean	47.7° F.
Latest frost, Milwaukee	May 9
Earliest frost, Milwaukee	Sept. 24
Precipitation, Milwaukee	
January	1.75 in.
July	2.37 in.
Annual	28.87 in.
Average growing season, Milwaukee	184 days

NATURAL RESOURCES

Before 1890 Wisconsin's plains were used for growing wheat, but a combination of conditions caused a transition to dairy farming. During this period, some of the farmers, especially those from Scandinavia and northern Europe, turned to old-country skills such as cheese-making for



higher income. Dairying is therefore the principal industry for two-thirds of the state.

The principal minerals produced in Wisconsin, in order of value, are stone, sand and gravel, iron, and zinc. Iron, zinc, and lead ores are found in the northern and southwestern counties; the Wisconsin portion of the Penokee-Gogebic iron range is in Iron County in the north. There are scattered deposits of potash, purite, barite, talc, clay, and lime, and much crushed and building stone. There is more gravel and sand in Wisconsin than in all but two other states. Of these mineral resources, the nonmetallic are the more valuable.

At one time, the entire state, except the prairies of the southwest, was forested. Particularly impressive were the virgin white pines in the north which supplied the mills in the Chippewa Valley. By 1905, most of the virgin forests of the Great Lakes had been cut over, and the lumber industry had moved westward. Today Wisconsin has 16,500,000 acres of commercial forest land. Effective state and Federal laws establishing conservation practices and regulating the use of these lands have done much to preserve the white and red pine, red oak, cedar, spruce, birch, elm, maple, ash, and aspen. Today oak, elm, sugar maple, hemlock, and yellow birch are the principal species cut. In 1953 there were an estimated 16,111,000,000 bd. ft. of live timber in the state.

Next to its dairy herds, Wisconsin's most important asset is its recreational facilities. More than 8,500 lakes provide fishing, boating, and bathing facilities. Lake fish include walleyed pike, muskellunge, trout, perch, black bass, sturgeon, and bluegill. There are more than 1,500 trout streams, in which more than 150,000,000 fish are planted each year. There are countless scenic panoramas, such as the view from Rib Mt. and the 165-ft. Manitou Falls of the Black River.

WISCONSIN'S ECONOMY

Although classified as an industrial state, Wisconsin has come closer to a balance between the manufacturing and agricultural segments of its economy than most industrial states. Of a total labor force of 1,354,554 in 1950, almost 31 per cent were engaged in manufacturing and almost 19 per cent in agriculture. Wholesale and retail trade together formed the third-largest employment sector, accounting for more than 17 per cent of the labor force.

Among Wisconsin's principal industries are metal-working (especially the manufacture of agricultural machinery), food processing (especially dairy products), and the brewing of beer (of which Wisconsin produces more than any other state). Other major manufactures include lumber and wood products, leather products (in which the state ranked third in 1950), meat products, flour, footwear, luggage, textiles, and furniture. Wisconsin leads the nation in the production of nonelectrical machinery and ranks high in production of automobile frames and parts, machinery parts, pasteurizing apparatus, and fabricated metal products. The port of Superior has the largest grain elevators and ore docks in the U.S. The value added by manufacture in 1956 was $3,949,000,000.

In 1954 Wisconsin had 153,558 farms; farm acreage totaled 22,507,288, with 146.6 acres the average per farm. Dairying, in which Wisconsin leads all the states, is the chief agricultural pursuit. In 1958 the state had *ca.* 4,300,000 cattle, of which 2,550,000 were milk cows. The 1957 calf crop (estimated at 2,456,000 head) ranked second to Texas. The state ranked fourth in the number of cattle on farms. Other livestock included 300,000 sheep and lambs and 1,800,000 hogs and pigs. In 1954 the total value of all Wisconsin livestock was almost $600,000,000. In 1958 Wisconsin led all the states in the production of beets, sweet corn, and green peas for canning. It is well known for its cranberries, mint for oil, cherries, strawberries, apples, cabbage, cucumbers, and maple syrup. In corn for silage, alfalfa, and hay production, Wisconsin ranked first among the states in 1957. The 1957 cash income from crops, livestock, and government payments was $1,063,505,000, of which dairy production accounted for more than half.

The total value of all forest products sold in 1954 was $4,423,000. Wood-pulp production in 1956 reached an unprecedented 1,238,767 tons, giving Wisconsin sixth place among the states.

The state contributed less than 1 per cent of total U.S. mineral production in 1957; its mineral output for that year was valued at $68,644,000, giving the state 33rd rank among the states.

TRANSPORTATION AND COMMUNICATION

Most of Wisconsin is bounded by water. With completion of the St. Lawrence Seaway, the already heavy freight traffic over Lakes Superior and Michigan was expected to increase by 500,000 tons of new cargo annually. Long trains of barges ply the Mississippi, discharging cargo at the port of La Crosse.

Wisconsin is served by a number of railroads. The first railroad to operate in the state was the Milwaukee and Mississippi (1851), now part of the Chicago, Milwaukee, St. Paul and Pacific R.R. Other railroads include the Soo Line, the Chicago and North Western Ry., the Milwaukee Road, and the Chicago, St. Paul, Minneapolis and Omaha Ry. Total railroad mileage is 6,266 m. In 1957 the state had 97,307 m. of roads, of which 89,389 m. were surfaced. All the principal cities have airports. The state has 112 radio stations and 18 television stations. The first newspaper published in Wisconsin was the Green Bay *Intelligencer* (1833). Today the leading newspaper is the Milwaukee *Journal*.

POPULATION

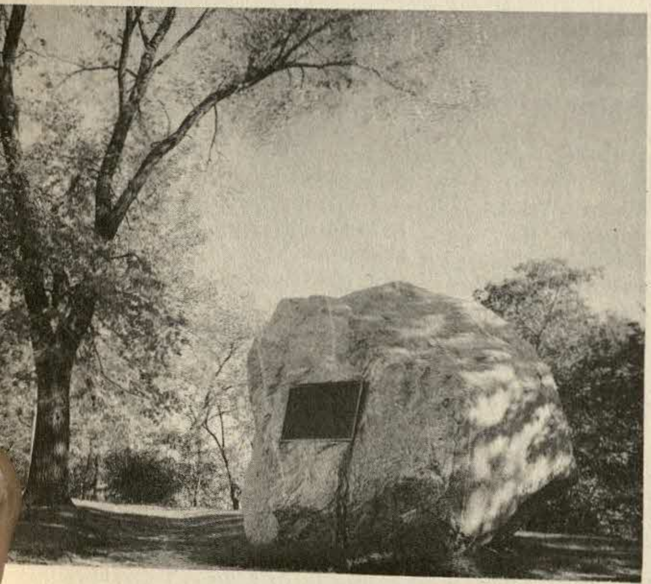
Wisconsin has 71 counties. The state's 1950 urban population comprised 57.9 per cent of the total population; the rural population, 42.1 per cent. The urban population increased by 13.5 per cent, the rural by 4.8 per cent, between 1940 and 1950. Almost half the total population lived in the urbanized areas of Milwaukee, Madison, and Racine. Wisconsin's population was estimated at 3,938,000 on July 1, 1958. In 1950 white persons numbered 3,392,690; of these, 3,174,456 were native born and 218,234 were foreign born. Nonwhite persons totaled 41,885; out of this group, 28,182 were Negroes and 12,196 were Indians, with the remainder including Japanese, Chinese, and others. Population density in 1950 averaged 62.8 per sq. m.

The major religious faiths, in order of size, in 1950 were the Protestant and the Roman Catholic, with a small Jewish group. The predominant Protestant bodies were the Lutheran Church—Missouri Synod, the Evangelical Lutheran Joint Synod of Wisconsin and Other States, the Evangelical Lutheran Church, The Methodist Church, and the American Lutheran Church.

Chief Cities: Milwaukee, on Lake Michigan, the state's largest city and the largest port, is

RURAL VISTA

Wisconsin is dotted with productive farms (*courtesy Ewing Galloway*)

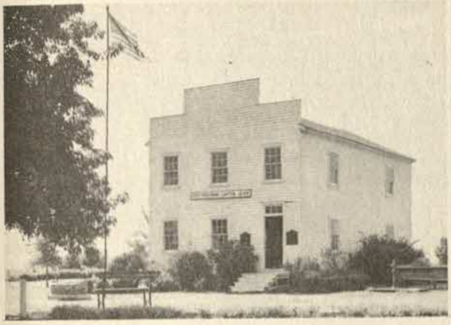


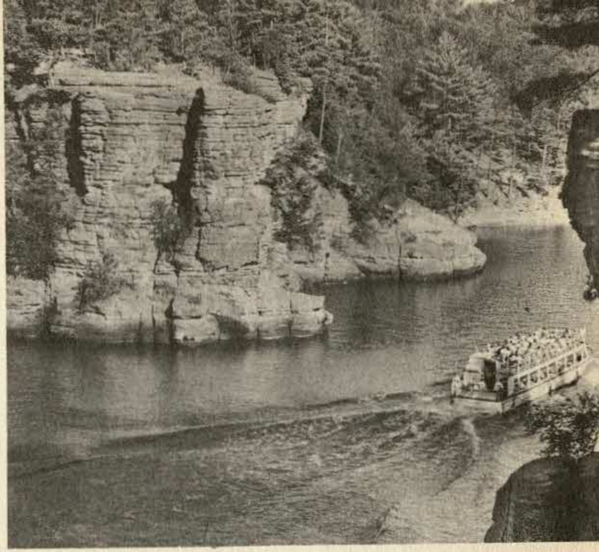
WISCONSIN SCENES

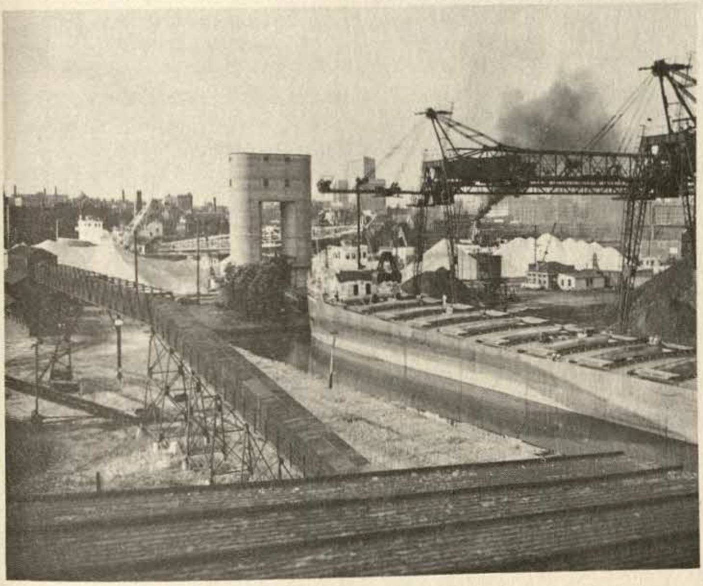
This statue of Robert M. La Follette (1855-1925), in the state capitol in Madison, memorializes a crusading governor and U.S. Senator (*courtesy Culver Service, N.Y.*). Chamberlin Rock, at the Univ. of Wisconsin, Madison, was named for Thomas Chrowder Chamberlin (1843-1928), who first distinguished and named the geological drifts left in the state by successive ice advances. This boulder, carried by the Continental Glacier from pre-Cambrian bedrock in Canada, was deposited in the area in the Wisconsin, or most recent, glacial drift (*courtesy Ewing Galloway*). Natural waterways, such as this one, have played an important part in the development of the paper-manufacturing industry in the Appleton area (*courtesy Philip Gendreau, N.Y.*)

MADISON'S FIRST CAPITOL (1836)

A city chosen capital before its settlement (*courtesy Wisconsin Conservation Dept.*)

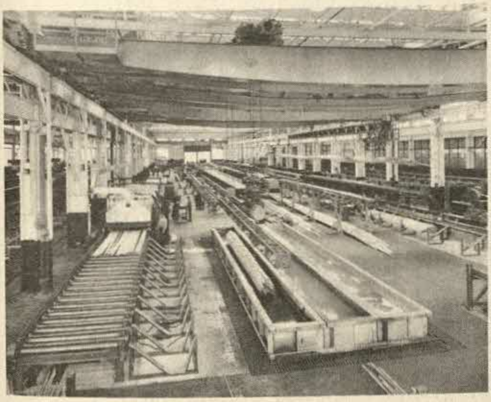






VALUED WATERWAYS

Wisconsin's many waterways are an advantage for transportation, and their rough beauty (*above*), particularly when preserved in state and national parks, attracts many tourists. Conservation and reforestation have restored much of these forest lands to their original grandeur. Milwaukee, on Lake Michigan, is the state's largest city, and its excellent harbor gives it an important place in the Great Lakes-St. Lawrence chain. Freighters unload such cargoes as coal and gravel at docks (*left*) situated near the city's business district, and they are loaded with a variety of manufactured products, including heavy machinery, beer, hosiery, automobiles, boots, and shoes (*courtesy Ewing Galloway, N.Y.*)



VARIED INDUSTRIES

Brass products (*above*) and cheeses are samples of economic diversity (*courtesy Anaconda Copper Mining Co.* and *Wisconsin Conservation Dept.*)

an industrial center producing machinery and beer. It is known as the "Deutsche Athens of the Midwest" for its German population and culture.

Madison, the capital and second-largest city, is the site of the Univ. of Wisconsin.

Racine, on Lake Michigan, the third-largest city, is a port and an important rail center and has diverse manufacturing plants.

Famous Men and Women: La Follette, Robert M. (1855-1925), statesman, lawyer; governor of Wisconsin (1900-1904); U.S. Senator (1906-25). He ran for President unsuccessfully on the Progressive party ticket in 1924.

Lenroot, Katharine Fredrica (1891-), social worker, who became associated (1915) with the U.S. Children's Bureau, and its director in 1934.

McCarthy, Joseph (1909-57), lawyer, judge, U.S. Senator (1946-57), who became known for his probing of Communism in government.

Mitchell, William Lendrum ("Billy"), (1879-1936), U.S. Army officer, noted for his advocacy of air power.

Turner, Frederick Jackson (1861-1932), educator, historian of the American frontier.

Veblen, Thorstein (1857-1929), economist, author of "The Theory of the Leisure Class."

Willard, Frances Elizabeth (1839-98), women's suffrage and temperance leader.

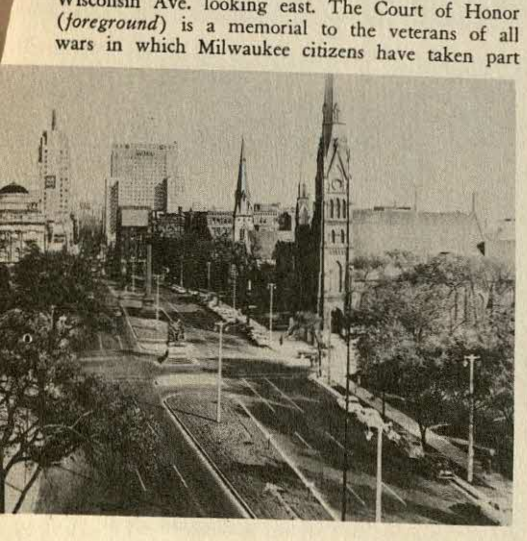
Wright, Frank Lloyd (1869-1959), one of the greatest architects of the 20th century.

EDUCATION

Education is free and compulsory for children between the ages of seven and 16. The public-school system was established in 1848. In 1957 public-school enrollment was 656,000. The state-supported institutions of higher learning include the Univ. of Wisconsin, Madison (with a branch in Milwaukee); the Wisconsin Inst. of Technology, Platteville; and state colleges at Eau Claire, La Crosse, Oshkosh, Platteville, River Falls, Stevens Point, Superior, and Whitewater. Among private and denominational institutions are Beloit Coll., Beloit; Lawrence Coll., Appleton; Marquette Univ. and Mt. Mary Coll., Milwaukee; and Ripon Coll., Ripon.

DOWNTOWN MILWAUKEE

Wisconsin Ave. looking east. The Court of Honor (*foreground*) is a memorial to the veterans of all wars in which Milwaukee citizens have taken part



Among cultural institutions are the Univ. of Wisconsin Geology and Natural History museums, Madison; and the Kenosha County Historical and Art Museum, Kenosha, with collections of scientific and historical material, paintings, sculpture, and photographs. Collections of material relating to the state's Indian and pioneer days are maintained at the Antigo County Historical Society Museum, Antigo; the Ft. Atkinson Historical Society Museum; and the Wisconsin Historical Society Museum, Madison. The Milwaukee Museum houses extensive archaeological and zoological collections.

GOVERNMENT

Wisconsin is governed under provisions of a constitution adopted in 1848 and amended many times. The constitution gives executive authority to a governor, lieutenant governor, secretary of state, treasurer, and attorney general, elected each even-numbered year. The legislature consists of a senate of 33 members elected for four-year terms and an assembly of 100 members elected for two-year terms. The legislature meets in Madison, the capital city, for regular sessions in the odd-numbered years. The length of the regular session is six months. The supreme court consists of a chief justice and six associate justices, elected for ten-year terms. The judiciary system also includes 22 circuit courts, with judges elected for six-year terms; county courts, with judges elected for four-year terms; and district, municipal, and justice-of-the-peace courts. The state is represented in the U.S. Congress by two Senators and ten Representatives.

HISTORY

In 1634 Samuel de Champlain sent Jean Nicolet, a French explorer, out from New France in search of a Northwest Passage. Crossing Lake Michigan, Nicolet landed at the head of Green Bay, where he was greeted by friendly Winnebago Indians as "wonderful man." In 1654 two French fur traders, Pierre Esprit Radisson and Médard Chouart, Sieur de Groseilliers, visited Green Bay and explored the Fox River. On a second expedition, in 1658-60, they explored the Lake Superior region and on Chequamegon Bay they built the first log hut in

Courtesy Racine Chamber of Commerce

AERIAL VIEW OF RACINE

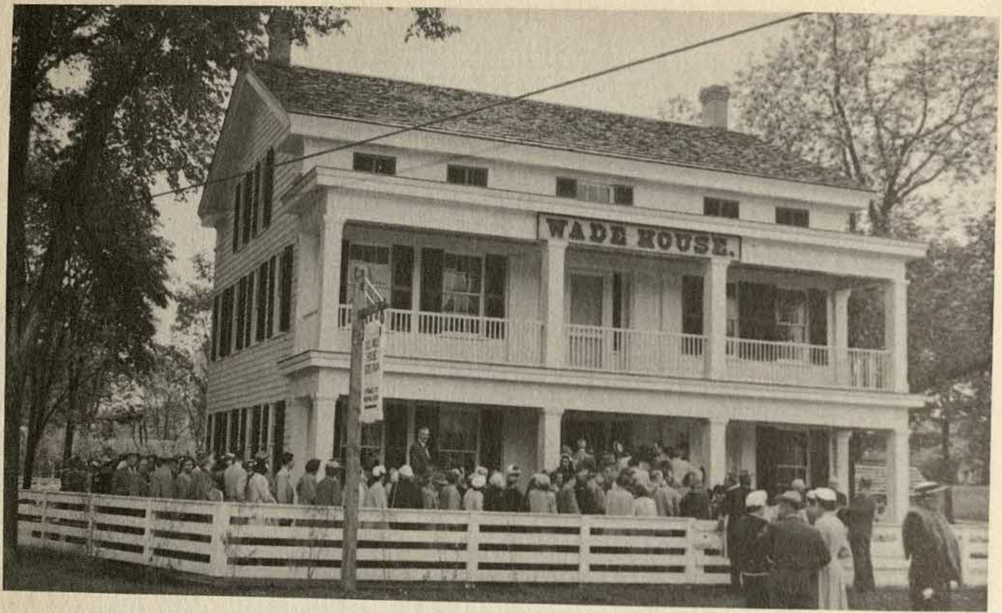
The city is an important port on Lake Michigan

Wisconsin. The Jesuit missionary René Ménard established the first Catholic mission, St. Esprit, at Ashland in 1661. A second missionary, Father Claude Jean Allouez, reopened St. Esprit in 1665, making it the first permanent mission. Four years later Allouez explored the Fox River and established the mission of St. Francis Xavier. In 1673, with Louis Joliet, Father Jacques Marquette set out down the Fox-Wisconsin waterway on the expedition that discovered the Mississippi River. Other Frenchmen, including Daniel de Greysolon, Sieur du Lhut, Nicolas Perrot, and Father Louis Hennepin, completed the exploration of the Great Lakes region and the Mississippi Valley. Fur traders followed them into the region, and military forces were established to protect the trade.

The period of French dominion was interrupted by Indian wars (1712-40) and ended with the English conquest of Quebec in 1760. During the English regime occurred the uprising headed by Chief Pontiac, which was not finally quelled until 1765. Wisconsin was then reopened to English and French traders, and some from the American colonies. Charles Michel de Langlade, the son of a French Canadian fur trader and his Indian wife, established the first permanent settlement, at Green Bay in 1764. The British retained control of the established forts and trading posts even after the Revolutionary War. They expanded their trade through the Northwest Co., thus intensifying a grievance settled only by the War of 1812, after which the British evacuated the area.

The territory east of the Mississippi was loosely organized under the Northwest Ordinance of 1787, but not until it was incorporated in the Michigan Territory was orderly civil government established in Wisconsin. Until 1830, economic interests in the area were dominated by John Jacob Astor's American Fur Co. The discovery of lead in southwest Wisconsin created the first real incentive to permanent settlement, and from 1824 to 1832 more than 2,000 miners—some of them Southerners bringing slaves, others Cornish immigrants—came up the Mississippi to the Mineral Point area, where they quarried the native limestone for their houses. Friction between the miners and the Indians resulted in the Black Hawk War; the powerful Indian and his followers were finally defeated in 1832.

Thereafter it was safe for New England farmers to drive their prairie schooners west to Wisconsin, and they soon were joined by streams of Scots, Welsh, Swiss, Irish, and Germans. A series of treaties with the Indians, signed between 1829 and 1833, gave the U.S. all the lands along the west shore of Lake Michigan in exchange for 5,000,000 acres across the Mississippi. A vast area was thus opened to settlement, which developed from three points: the Green Bay area, Milwaukee, and the southwest mining region. By 1834 land offices at Green Bay and Mineral Point were doing a



Courtesy Sheboygan Assn. of Commerce

WADE HOUSE, A STATE HISTORICAL SHRINE

Once called Halfway House, the historic building is at Green Bush, Wis., about halfway between Sheboygan and Fond du Lac, on the route of the Old Plank Road that linked the two cities

brisk business in lot sales, some in "Milwauky county" selling for as much as $1,000. Wisconsin was organized as a separate territory in 1836. The first council met at Old Belmont, near Leslie, but by the end of the year Madison had been selected as the capital. In 1848 Wisconsin was admitted to the Union as the 30th state.

On the eve of the Civil War, when President Lincoln issued his call for volunteers in 1861,

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	*Size and Location*	*Points of Interest*
Chequamegon National Forest (established 1933)	1,035,404 acres, in northern Wisconsin (U.S. 8, 63; state 13, 64, 70, 77, 182)	Covers a vast area in six counties; many lakes and rivers; pine, spruce, and balsam forests
Nicolet National Forest (established 1933)	988,853 acres, in northeastern Wisconsin (U.S. 8, 45; state 32, 52, 55, 64, 70, 139)	Covers a vast area in six counties; many lakes and trout streams
American Legion State Forest (established 1929)	37,234 acres, in Oneida County, north of Rhinelander (off U.S. 8; state 47)	Lakes; wooded terrain; swimming, camping
Brule River State Forest (established 1906)	18,612 acres. in Douglas County, southeast of Superior (U.S. 2; state 27)	River scenery; swimming, camping
Council Grounds State Forest (established 1938)	278 acres, in northern Wisconsin, 1 m. W. of Merrill (U.S. 51)	Pine woods; river scenery
Flambeau River State Forest (established 1930)	68,900 acres, in northern Wisconsin, west of Fifield (state 70)	River scenery; wilderness canoeing; swimming, camping
Kettle Moraine State Forest (established 1937)	Two sections, in eastern Wisconsin: northern unit, 10,725 acres west of Plymouth (U.S. 45; state 23, 67); southern unit, 5,500 acres east of Whitewater (state 59, 67, 106)	Glacier-formed hills and valleys; swimming, camping
Northern Highland State Forest (established 1911)	125,113 acres, in northern Wisconsin, north of Rhinelander (U.S. 51; state 155)	Wooded terrain; glacier-formed lakes; swimming, camping
Point Beech State Forest (established 1937)	1,958 acres, on Lake Michigan, 4. m. N. of Two Rivers (state 42, 147, 177)	Pine woods and sand dunes; swimming, camping
Wyalusing State Park (established 1917)	1,671 acres, in southwestern Wisconsin, 4 m. S. of Prairie du Chien (U.S. 18; State 60)	Confluence of Mississippi and Wisconsin rivers; wooded bluffs; camping
Cave of the Mounds	In south central Wisconsin, west of Madison (U.S. 18)	Natural cave with stalagmites, stalactites, and other interesting formations
Door County	On the peninsula, 20 m. N. of Green Bay (state 42, 57)	Cherry land; picturesque fishing villages; Washington Island
Menominee Indian Reservation	400 sq. m., in northeastern Wisconsin, north of Shawano (state 47, 55)	Virgin white-pine forest
Wisconsin Dells	In south central Wisconsin, on the Wisconsin River (U.S. 12, 16; state 13)	Seven miles of sandstone cliffs, narrow glens, and spectacular rock formations in the river canyon

TWO VIEWS OF WISCONSIN

The state capitol at Madison (*Wisconsin Conservation Dept.*). At the Witches Gulch near Wisconsin Dells, the Wisconsin River has carved the soft stone into fantastic shapes and forms (*Ewing Galloway, N. Y.*)

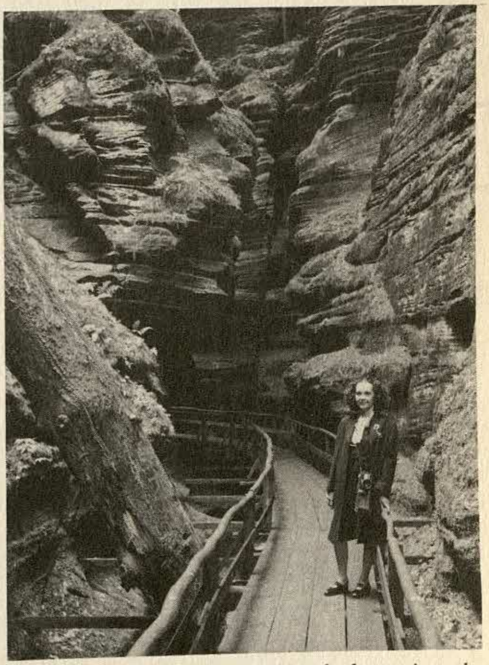
Wisconsin responded by mustering 36 companies within a week. Altogether the state sent 91,379 men to the Union army.

Since 1890 the state has enacted much progressive legislation. It was the first to pass a corrupt-practices act, a direct-primary law, regulatory legislation on railroad rates, and laws providing for unemployment benefits, workmen's compensation, conservation, and inheritance and income taxes. This program was carried into effect through the leadership of Robert M. La Follette, who backed it as "the Wisconsin idea." In 1920 Wisconsin was the first state to ratify the 19th Amendment to the Constitution, giving women the vote.

In World War I, Wisconsin furnished 120,663 personnel to the armed forces; in World War II, 332,196 Wisconsin residents served. In the postwar years, Wisconsin continued to move forward, both in the health of its economy and in legislative progressivism. Manufacturing made great strides, and the state inaugurated a long-range building program on which, by 1958, more than $125,000,000 had been expended.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Wisconsin Dells, a city and summer resort in central Wisconsin, on the Wisconsin River, 43 m. N.W. of Madison. It is served by the Chicago, Milwaukee, St. Paul and Pacific R.R. Located in an agricultural area specializing in dairy products, grain, and potatoes, its chief manufactures are hardware, pickles, and butter. It is the gateway to the unusual rock formations in The Dells (see *Dalles*). Settled *ca.* 1850, it was incorporated in 1925 and was called Kilbourn until 1931. Population, 1950, 1,957.



Wisconsin Rapids, a city in Wisconsin, seat of Wood County, 120 m. N.W. of Madison, on the Wisconsin River. It is served by the Green Bay and Western, the Chicago, Milwaukee, St. Paul and Pacific, the Soo Line, and the Chicago and North Western R.R.'s. The city is a manufacturing and agricultural center; it produces paper, plastics, and appliances. Originally the city consisted of Centralia, on the west bank, and Grand Rapids, on the east bank. The two towns were consolidated in 1900 under the name of Grand Rapids. This subsequently led to confusion with the town of Grand Rapids, Mich., however, and the city's name was changed to Wisconsin Rapids in 1920. Population, 1940, 11,416; in 1950, 13,496.

Wisconsin, UNIVERSITY OF, a coeducational state land-grant institution of higher learning at Madison, Wis., established in 1848. It comprises colleges of agriculture, engineering, letters and science, and schools of commerce, education, graduate studies, home economics, journalism, law, library science, medicine, nursing, and pharmacy. Adult education and public services are provided by its general extension, agricultural extension, radio and television stations, hospitals, and a number of other agencies. It has a unit in Milwaukee (the Univ. of Wisconsin-Milwaukee) and has eight extension centers in other Wisconsin localities. Its libraries have more than 1,000,000 volumes. The annual fulltime student enrollment totals *ca.* 25,000, and there are some 3,000 members of the faculty. The physical plant is valued at about $55,000,000.

Wise (*wīz*), HENRY ALEXANDER, jurist and statesman, born in Drummondtown, Va., Dec. 3, 1806; died in Richmond, Va., Sept. 12, 1876. In 1825 he graduated from Washington Coll., in Pennsylvania, and studied law at Winchester, Va. He was elected to Congress as a Democrat in 1832, serving until 1843. He sided with the Whigs in opposition to the bank policy of Andrew Jackson. In 1840 he supported Gen. Harrison for President, and throughout the administration of John Tyler exercised a powerful political influence. He was minister to Brazil (1844-47). In 1854 he was elected governor of Virginia and signed the death warrant of John Brown in 1859. He entered the Confederate service as a brigadier general in 1861, but was unsuccessful in a number of engagements. His forces were finally captured on Roanoke Island, Sept. 7, 1862, where his son, Obadiah J. Wise, was killed. He practiced law at Richmond after the close of the war, and published "Memoir of John Tyler" and "Seven Decades of the Union."

Wise, STEPHEN SAMUEL, Jewish scholar, born at Budapest, Hungary, on Mar. 17, 1874; died in New York City, Apr. 19, 1949. Brought to the U.S. in early childhood, he was graduated from Columbia Univ. in 1892, and received his Ph.D. from the same university in 1901. Following in the footsteps of his father, Rabbi Aaron Wise, he took orders, and later distinguished himself in Jewish and philanthropic affairs. He served in New York City and in Portland. Ore., and in 1907 founded the Free Synagogue of New York, a reform congregation, of which he remained the spiritual head until his death. The founder and president of the American Jewish Congress and the author of several religious and sociological works, including "How to Face Life," "As I See It," and "The Great Betrayal," he gained prominence for his contributions to Zionism.

NBC Photo

STEPHEN S. WISE

Wiseman (*wīz′mạn*), NICHOLAS PATRICK STEPHEN, churchman and writer, born of Irish parents in Seville, Spain, Aug. 3, 1802; died in London, Feb. 15, 1865. After studying academic subjects and law in Ireland, he studied theology at Rome. In 1825, he was ordained a Roman Catholic priest, became professor of Oriental languages in the English Coll. in Rome, and returned to England in 1829. He officiated as a preacher and lecturer and published a number of works, including treatises on the doctrines and practices of the Catholic Church and a treatise on the Holy Eucharist. Gregory XVI made him coadjutor bishop in 1837. Later he became president of St. Mary's Coll., and was made vicar apostolic of the London district in 1849. The Pope summoned him to Rome in 1850 and made him an archbishop and afterward a cardinal.

Wissler (*wĭs′lẽr*), CLARK, anthropologist, born Sept. 18, 1870, in Wayne Co., Ind.; died Aug. 25, 1947. He was educated at Indiana and Columbia Univs. In 1901-02 he was an instructor in education at New York Univ.; in 1903 he served first as an assistant and later as a lecturer in anthropology at Columbia Univ. In 1903 he also became an assistant in anthropology at the American Museum of Natural History, where he served as curator from 1906-41. He was professor of anthropology at Yale Univ. from 1924-40. Wissler is particularly noted for his studies of the culture and society of the American Indian. His numerous books include: "North American Indians of the Plains" (1912), "Man and Culture" (1922), "The Relation of Nature to Man in Aboriginal America" (1926), "Social Anthropology" (1929), "The American Indian" (1938), "Indian Cavalcade" (1938), and "The Indian in the U.S." (1940).

Wissman (*vĭs′män*), HERMANN VON, African explorer, born at Frankfort-on-the-Oder, Germany, in 1853; died June 16, 1905. He was trained for a military career and in 1874 became a lieutenant. In 1880 he was made an attaché of the German-African Society and accompanied Dr. Pogge on an expedition of discovery. He explored the Kassai River in 1883 and subsequently visited many points of interest in the Congo basin and regions farther north, including Lakes Nyasa and Tanganyika. The government of Germany made him a commissioner in 1889 to suppress an Arab uprising in East Africa, and he was governor of that region from 1895-96. He published "Interior Africa" and "My Second Tour of Equatorial Africa from the Congo to the Zambesi."

Wistaria (*wĭs-tā′rĭ-ȧ*), a genus of climbing shrubs of the bean family, so named for Caspar Wistar (1761-1818), professor in the Univ. of Pennsylvania. The leaves are pinnate and the flowers grow in clusters, generally having a lilac color. The seeds are beanlike, usually numbering five to eight, and grow in a slender pod. Several widely different species are cultivated, the best known being the *common wistaria* and the *Chinese wistaria.* They are often planted to cover verandas and walls. Under careful cultivation they grow 18 to 25 ft. in a season and produce flowers in profusion. In some species the flowers are pure white.

Wister (*wĭs′tẽr*), OWEN, author, born in Philadelphia, Pa., July 14, 1860; died in 1938. He studied at Harvard Univ. and took up the practice of law, but soon gave his attention to literature. His writings consist chiefly of novels and short stories of Western life. Among his books are: "Red Men and White," "The Jimmy John Boss," "The Virginian," "Journey in Search of Christmas," "Lin McLean," "Lady Baltimore," "Neighbors Henceforth," "When West Was West," and "Roosevelt—The Story of a Friendship." He was made an honorary Doctor of Laws by the Univ. of Pennsylvania (1907).

Witchcraft (*wĭch′krȧft*), an alleged art which is supposed to be understood by witches and wizards only. Belief in witchcraft represents the last remainder of magic tendencies of prehistoric times when these magic powers were attributed to priests and medicine men. Even in historic times, magic cults have been preserved among primitive peoples, and connected with them is always the belief in witchcraft. Witchcraft could be used for good and evil purposes alike. The conjuring of the spirits of the dead, prophesying about the future, doing harm, and curing illnesses are the basic elements of witchcraft action. When higher types of religion developed, sorcerers were considered as standing outside of human society, in pagan Greece and Rome as well as among the Jews. In the Old Testament, necromancers are mentioned sometimes, but always in contrast to the legitimate priests.

Evidences are abundant that people in past

WITCHES BURNED AT THE STAKE

German woodcut, 16th century

ages believed that certain individuals possessed supernatural power or influence by reason of being connected with some inspiration of darkness. Sometimes it was supposed that these persons had made an oral or written compact with the devil, who came to their assistance in practicing infernal arts as a consideration for having abjured God. The compact was either for a certain number of years or of indefinite duration and not only implied obedience to the evil one, but the latter delivered to the witch an imp or familiar spirit to do whatever was directed. Sometimes people considered witches and sorcerers as especially gifted by nature, without their own fault. It is interesting to note that certain animals such as toads, black cats, and owls were often connected with witchcraft, a fact which shows that the whole concept goes back to the magic of totem and tabu (*qq.v.*). In the Christian era, the Church did not acknowledge witchcraft but fought against it. When pagan feasts and gatherings of non-believers began to decline, the members of these earlier cults were identified with witches and sorcerers, and so old women and men, holding to the old beliefs, came under suspicion as witches and sorcerers. In addition, these pagans themselves spread the idea that they knew dangerous practices in order to deter their superstitious and fanatical persecutors. Thus it was finally the devil himself with whom they allegedly were allied and under whose leadership they brought misfortune and disease to their fellow men. We read of an ecclesiastical decree, published in 350 A.D., in which soothsayers, sorcerers, and magicians were classed as witches and condemned as enemies of God. There were, however, some enlightened men like Agobert, Bishop of Lyon (*ca.* 840), and Burkhard, Bishop of Worms (*ca.* 1020), who fought against these superstitions, but in vain.

Many proofs may be cited of profound belief in witchcraft in all the civilized countries throughout the Middle Ages. It was especially in the 13th and 14th centuries that the clergy began to identify witchcraft with heresy (*q.v.*), since they,. the clergy, claimed to be the only ones who knew anything about the supernatural world. In the 15th and 16th centuries, the Popes Eugene IV, Innocent VIII, Julius II, and Adrian VI issued bulls against witches. Even Martin Luther (*q.v.*) believed in witches and condemned them.

Thus it was only natural that the Church supported the persecution of the alleged witches and condemned most of them to death. Executions of supposed witches took place with official sanction in Great Britain as late as 1722. It is remarkable that a judge of the court of queens bench in England declared in the 17th century that the common law recognized witchcraft as a crime. Even Roger Bacon (*q.v.*) had a pronounced belief in the existence of witches. In literature, too, we find mention of the popular beliefs regarding witchcraft.

In order to elicit confessions, severe tortures were applied in the most hideous ways. It was believed that the devil had marked a spot on the body of a witch which was insensible to pain, hence it became a common practice to cut into the flesh or pierce the skin with a sharp instrument in order to find whether the person tortured could be classed as guilty. In some cases persons were thrown into deep water, those floating being regarded as devil-possessed, while those sinking were thought innocent. In 1515, 500 persons were executed for witchery in Geneva and 975 were burned at Como in 1524. The total number of deaths in Scotland, owing to charges of witchery, is placed at 4,000.

Especially in Germany, witchcraft trials eradicated an enormous number of innocent people. The whole jurisdiction during the 15th and 16th centuries favored possible witnesses against witches. Even heretics and Jews were admitted as witnesses, as were children against parents, brothers against brothers, etc. From this time on, the figure of witch and sorcerer permeated German folklore and certain mountains were considered as gathering places (*e.g.*, Blocksberg or Brocken), certain nights (*e.g.*, Walpurgis night). There allegedly the witches met riding on brooms, accompanied by goats, etc. Sexual orgies were always connected with these fancied ideas, witches mated with the devil, witches with human beings, human beings with animals. Witches were said to prepare certain ointments which would endow people with eternal youth. The most peculiar fact is how often even the most absurd accusations against alleged witches were proved by the self-accusations of poor innocent people under torture and confirmed by witnesses. Modern psychology considers these self-confessions as examples of individual and social psycho-pathology and of hysteria. There were, however, courageous men who fought against the Inquisition and called the belief in witches just another superstition, among them Catholic and Protestant churchmen alike.

National governments always tried to fight against this superstition of witchcraft and attempted to gain jurisdiction over witches and sorcerers from the Church. The Parliament of Paris (1390) succeeded in this purpose and from then on the witchcraft trials decreased in France, but at the end of the 15th century the Inquisition had won back the jurisdiction from worldly tribunals.

Belief in witchcraft spread rapidly among the Puritans of New England around 1648, and for more than a century there was a widespread belief in the supposed supernatural power of certain individuals. Cotton Mather (*q.v.*) aroused the superstitious to believe in witches at Salem, Mass., where he fanatically preached against the art. His published works had an unfortunate influence among the people. Samuel Willard, a minister of Massachusetts, in 1671, proclaimed that a woman of his congregation was bewitched, but she was proved insane instead of possessed. In the period between 1684 and 1693 more than 100 persons were tried and convicted of witchcraft and many of them were hanged in the colonies. Nineteen executions for alleged witchcraft took place at Salem in 1692. The delusion seems the more deplorable when it is considered that in many cases the evidence of little children and unreliable witnesses was taken as conclusive. Thomas Brattle and Robert Calef, two Boston reformers (*ca.* 1700), took a decisive position against the delusion, and it was due largely to their efforts that the belief rapidly passed away.

Witch Hazel (*wĭch hā′z′l*), or WYCH HAZEL, a shrub native to the eastern part of the U.S. and Canada, growing usually to the height of 6 to 10 ft. The trunk branches near the ground, forming several crooked subtrunks about 4 in. thick. These plants grow principally in damp woods and are so named from the resemblance of their leaves to the hazel. They bear yellow flowers late in autumn, when the leaves are falling, and the fruit, which is a woody, two-seeded capsule, matures the following summer. The small branches are used as divining rods by those who believe that they turn downward when held in the hand to indicate the location of water and water veins below the surface. The liquidambar is a forest tree belonging to the same class of plants and attains a height of 20 to 30 ft.

Witenagemot (*wĭt′ę-nȧ-gę-mōt*), the national council of the Anglo-Saxons and the forerunner of the English Parliament. The small heptarchy was divided into separate kingdoms and each of these had a general council of this class. It consisted of the thanes, ealdormen, and the higher ecclesiastics and was presided over by the king. This body had general legislative power, concluded treaties, had authority to depose a king, and settled the question of succession to the throne when a dispute arose. In practice a powerful king subverted the authority of the council to a minor position, but a weak ruler was usually governed by its orders. This body was abolished by William the Conqueror, but not until after it had acknowledged his title to the throne.

WITCHCRAFT TRIAL IN COLONIAL TIMES

Courtesy The Bettmann Archive, N. Y.

Witherspoon (*wĭTH'ẽr-spōōn*), JOHN, signer of the Declaration of Independence, born in Gifford, Scotland, Feb. 5, 1723; died near Princeton, N.J., Nov. 15, 1794. He was graduated from the Univ. of Edinburgh in 1742, became a Presbyterian pastor at Paisley, and in 1768 accepted the presidency of Princeton Coll., New Jersey. He introduced lectures on political science, mathematics, international law, and moral philosophy and the study of Hebrew and French. In 1776, he was sent as a representative to the Continental Congress and while in Philadelphia signed the Declaration of Independence. He remained a member of Congress until 1782. His later years were devoted to the administration of the college, in whose interest he visited Europe twice.

Witness (*wĭt'nĕs*), one who appears before a court and is examined under oath or affirmation as to his knowledge of matters undergoing judicial investigation. The writ by which a witness is summoned to appear is called a *subpoena*. Testimony by a witness may be given in open court, when it is usually recorded by a reporter, or it may be taken before some officer in the form of a written deposition and read at the time of the trial. Any person who is of sound mind and has sufficient capacity to understand the nature of the obligation of an oath is competent to testify as a witness, but in some cases a husband and wife are not allowed to give testimony against each other. A person who signs his name to certify to the genuineness of another signature is termed a *witness*.

Witte (*vĭt'ẹ*), SERGE, statesman, born in Tiflis, Russia, June 17, 1849; died Mar. 13, 1915. He was descended from a family of Dutch immigrants to Russia. In 1870 he was graduated from the Univ. of Odessa and soon after entered the railroad service. He was a director of the southwestern railroads during the Russo-Turkish War and in 1888 became head of the department of railway affairs. He was made minister of finance in 1892, became secretary to Nicholas II in 1896, and was chief peace commissioner to settle the war with Japan in 1905, negotiating the Treaty of Portsmouth, N.H. His efficient public service caused his appointment as premier of the new constitutional cabinet in the same year, but he resigned in 1906.

Wittekind (*vĭt'ẹ-k̇ĭnt*), or WIDUKIND, leader of the Saxons, died *ca.* 807 A.D. It is probable, although not certain, that he fought against the Franks under Charlemagne even before 776 and it is quite certain that he led the Saxons against the Franks in 778. He may have participated in the Saxon victory at Suntelberg in 782 and have led his countrymen in the following two years against the enemy. In any case, the Saxons were finally defeated in 785 and, as was the custom, were baptized by the Christian Franks. Wittekind's sponsor for baptism was Charlemagne himself. The facts of his life from that time are as uncertain as those of his earlier years, but it is believed that he returned to Saxony and eventually died in battle. He was the first leader strong enough to organize the previously independent Saxon tribes into a unit adequate to face the Franks under Charlemagne.

Wittenberg (*wĭt'ẹn-bĕrg*), a city of Germany, in the province of Saxony, on the Elbe River, 54 m. s.w. of Berlin. It is at the junction of several railways. The surrounding country is fertile, producing fruits and cereals in abundance. Wittenberg is famous as the home of Luther and Melanchthon, both of whom have tombs in the Schlosskirche, on the door of which Luther nailed his 95 theses. The university in which Luther taught was united with Halle in 1817. Among the manufactures are linen and woolen goods, leather, machinery, chemicals, and clothing. It was formerly a strongly fortified place and was the seat of the dukes of Saxony until 1422. In 1806, Napoleon captured it, but it was retaken by the Prussians in 1814. It was included in the Russian zone of occupation, 1945. Pop., *ca.* 23,000.

Woad (*wōd*), a genus of plants found in Europe, belonging to the mustard family. Several species furnish a blue dye, which is extracted from the leaves. These plants were the principal source of such dyes until indigo was introduced. The leaves do not contain the blue coloring matter ready formed, but it is produced by subjecting them to a process of fermentation. Formerly the common woad was cultivated extensively for its leaves, which were picked and dried for transportation to the factory, where the coloring matter was developed and extracted. Indigo, a finer and stronger blue, later replaced this coloring material; this in turn has been largely superseded by chemical dyestuffs. A species of wild woad is found in England, where the Picts are said to have used it in coloring their bodies.

Woburn (*wōō'bûrn*), a city in Middlesex County, Massachusetts, 10 m. N.W. of Boston, on the Boston & Maine R.R. The manufactures include leather, glue, chemicals, electrical supplies, clothing, and machinery. The place was first settled in 1640 and two years later was incorporated as a town. It was chartered as a city in 1888. Population, 1950, 20,492.

Woden (*wō'dẹn*), or WODAN, the name of an ancient deity of the Anglo-Saxons, corresponding to Odin of the Scandinavians. Wednesday, the fourth day of the week, was named from him. See also *Odin*.

Wodehouse (*wŏd'hous*), PELHAM GRENVILLE, author, born at Guildford, England, in 1881. He received his education at Dulwich Coll., and worked for two years in a London bank, doing free-lance writing in his leisure time. In 1903 he became a newspaper columnist and began to achieve distinction as a humorist. His first novels appeared in 1910. From then until World War II his reputation rose steadily until he was one of the most popular humorous writers in England. Among his most successful books were: "Uneasy Money" (1917), "Piccadilly Jim" (1918), "A Damsel in Distress" (1919), "The Indiscretions of Archie" (1921), "The Clicking of Cuthbert" (1922), and the series of "Jeeves" stories, appearing from 1911 onward, collections of which later were published in one volume, "The Jeeves Omnibus." He also wrote the lyrics for a number of musical comedies. He spent months of each year in the U.S., where he had as large a following as in England. His American characters, unlike those of most other British novelists, were recognizable as Americans to readers in the U.S. Sinclair Lewis once said of him: "He is the master of the touchingly inane."

His reputation was damaged by his pro-Nazi radio broadcasts from Berlin, following his capture (1939) and internment in Germany during World War II. Resuming his literary career after the war, Wodehouse published "America, I Like You" (1956), "The Ice in the Bedroom" (1961), and "Author! Author!" (1962).

Wöhler (*vē'lẽr*), FREDERICK, chemist, born in Eschersheim, near Frankfort, Germany, July 31, 1800; died in Göttingen, Sept. 23, 1882. He studied medicine and chemistry at the Univs. of Marburg and Heidelberg. In 1824 he joined the Swedish chemist, Berzelius, and others, to make a tour of Northern Sweden and Norway. On returning to Germany, he formed the acquaintance of the chemist Liebig, and in 1825 became a lecturer on chemistry at Berlin. He later lived at Cassel, where he aided in establishing an industrial school. In 1836 he was made professor of chemistry at the Univ. of Göttingen. His active career as a teacher extends over a period of more than 50 years. He was one of the founders of the entire science of organic chemistry and his discoveries in this field were among the most important ever made. In 1828, he accomplished the synthesis of urea, thus for the first time producing a natural organic compound from inorganic material. He accomplished the isolation of aluminum, beryllium, yttrium, and other elements, and was the first to observe cases of isomerism. He wrote "Textbook of Chemistry" and edited "Annals of Chemistry and Pharmacy."

Wolcot (*wo͝ol'ḳŭt*), JOHN, poet and satirist, known generally by his pen name, *Peter Pindar,* born at Dodbroke, England, in 1738; died in London, Jan. 14, 1819. He studied at the Kingsbridge and other free schools and later in France. He studied medicine, took orders in the Church of England, and practiced as a physician for 12 years. He had, however; early manifested an interest in writing, having published his first essays in 1756, and therefore turned later to writing as a profession. He worked with a broad sense of humor, great imaginative power, and pungent wit, and his satires were widely read, especially those relating to King George III, entitled "The Royal Visit to Exeter" and "Peeps at St. James's." It was only natural that his bitterly sharp satiric attacks brought him enemies, but at the same time they brought him fame. As an art critic he was rather modern and his reviews are still of some interest today. Other writings include: "An Epistle to James Boswell," "Complimentary Epistle to James Bruce," and "Lyric Odes to the Academicians."

Wolcott (*wo͝ol'ḳŭt*), ROGER, governor of Connecticut, born in Windsor, Conn., Jan. 4, 1679; died in East Windsor, May 17, 1767. He was apprenticed to a weaver when 12 years old and in 1700 established an independent business. In 1709 he was elected to the Connecticut assembly, and two years later accompanied an expedition into Canada. He served successively as a member of the council, was judge of the county court and of the supreme court, held the office of deputy governor, and in 1741 became major general of Connecticut forces. In 1745 he commanded at the siege of Louisbourg and was governor of Connecticut from 1750-54. He published several poetical and historical works. His son, *Oliver Wolcott* (1726-97), commanded a brigade under Gen. Gates at Saratoga, was a member of Congress from 1784-85, and became governor of Connecticut in 1796. His grandson, *Oliver Wolcott* (1760-1833), was an eminent politician. He was Comptroller of the Currency from 1788-89, auditor of the U.S. Treasury from 1789-91, and in 1795 succeeded Alexander Hamilton as Secretary of the Treasury. From 1801-02 he was a U.S. circuit judge and from 1817-27 served as governor of Connecticut.

Wolf (*wo͝olf*), a quadruped of the genus *Canis.* It is closely allied to the dog, of which it is thought to be the progenitor. A number of species have been described, all native to the Northern Hemisphere. The possible exceptions are the Aguana wolves of South America, which are allied to the prairie wolves, and the Tasmanian wolf, a marsupial. The *gray wolf,* which is gray above and yellowish gray below, is the most familiar species of North America. It is 3 to 4 ft. long, has a somewhat bushy tail and pointed ears, and formerly roamed in packs in New England and westward. Other American species include the *dusky wolf* of the Northwestern states, the *rufous wolf* and the *black wolf* of the Southern states, and the *prairie wolf,* or *coyote,* of the plains of Canada and the U.S. The last named is a burrowing animal and more nearly resembles the jackal than the wolf.

All the species of wolves are carnivorous, pursuing their prey with much swiftness and rapacity. They are the particular dread of shepherds, whose flocks they attack. They prey upon calves, deer, and elks and some species, when hungry, even attack man. Large numbers of wolves are found in many parts of Europe, especially in the more isolated sections of Russia, Spain, Turkey, France, Germany, and Italy. The *common wolf* of Europe gathers in packs on the northern plains of Russia, where it is dreaded as an enemy to man and domestic animals, often pursuing travelers and visiting barnyards. In Southern Europe wolves find a refuge in the forests and snowy slopes of the Alps, Pyrenees, and other mountains. The true wolf has a dismal howl, which it issues when in packs, but some species have a snapping bark. All the species are crafty and cunning in searching for food and protecting their young.

Wolf (*wŏŏlf*), CHRISTIAN VON, philosopher, born in Breslau, Germany, Jan. 24, 1679; died Apr. 9, 1754. In 1703 he graduated from the Univ. of Leipzig, where he became a lecturer, but subsequently was made professor of sciences at Halle. He was temporarily suspended on a charge of heterodoxy, but was reinstated in 1740 at the instance of Frederick the Great. In 1743, he became chancellor of the university and two years later was created a baron for his services in educational work. His philosophy was generally accepted until the time of Kant.

Wolf, a representative of the German Enlightenment, is notable for the lucidity of his thought, based on mathematical methods. He is not intrinsically original, but his philosophy may be considered as a popularization of the ideas of Leibnitz (*q.v.*), although he did not subscribe to the latter's metaphysical theories. It is interesting that Wolf dealt with almost all branches of science in 22 volumes, each of them once written in Latin, and then, abridged, in German. Thus it may be said that Wolf created a specific scientific German terminology. His writings include "Empirical Psychology," "General Cosmology," and "Moral Philosophy."

Wolfe (*wŏŏlf*), CATHERINE LORILLARD, heiress and philanthropist, born in New York City in 1828; died in 1887. She was the daughter of John David and Dorothea Ann (Lorillard) Wolfe, both members of wealthy families. When she was middle-aged she inherited their combined fortunes, conservatively estimated at more than $12,000,000, and was said to be the richest unmarried woman in the world at the time. She began to make lavish donations to various philanthropies, in the 15 years from 1872-87 dispensing approximately $4,000,000. Recipients included Grace Church, St. Luke's Hospital, a newsboys' lodging house, and a mission for underprivileged children, all in New York; and schools and churches in various parts of the West and South, and abroad. She contributed to several American colleges and financed an archeological expedition to Babylon in 1884. She also was known as an art patron. Her collection of paintings, principally by 19th-century European artists, was valued at $500,000 in 1887. At her death she bequeathed the entire collection and an endowment of $200,000 to the Metropolitan Museum of Art in New York. She was never married.

Wolfe, CHARLES, poet and clergyman, born in Dublin, Ireland, Dec. 14, 1791; died at Cork, Feb. 21, 1823. He was graduated from the Univ. of Dublin, where he was a tutor for some time, and afterward became a clergyman in Tyrone County. Afflicted with consumption, he went to Southern France in search of health, but soon returned to Ireland. His best-known poem is "The Burial of Sir John Moore," which was written while he was still a student. A volume of his sermons and poems was published after his death under the title "Remains and Memoir."

Wolfe, JAMES, military leader, born in Westerham, England, Jan. 2, 1727; died Sept. 13, 1759. He was commissioned as ensign in 1741 and embarked for Flanders, where he took part in several campaigns and was present at the Battle of Dettingen. In 1745 he took part in the suppression of a rebellion in Scotland, where he distinguished himself in the Battles of Falkirk and Culloden. He served against the French at the Battle of Lauffeld, was made major in 1749, and the following year became lieutenant colonel. He attracted the attention of Pitt in the expedition against Rochefort, in 1757, and in the following year was appointed to command a brigade in America. Cape Breton was the objective point of his military exploit. Afterward Wolfe urged an attack on Quebec, then strongly fortified and garrisoned, and he was made major general with orders to proceed in the plan of capturing it. In June 1759, he appeared near the city with 8,000 men, where he was opposed by a powerful French army under Montcalm. All attempts to capture the city were resisted successfully by the French and the English began to grow discouraged, but in September Wolfe's forces made a daring and dramatic ascent to the Plains of Abraham, thus outflanking the formidable natural defenses of the Rock, where he completely defeated the French and captured the city. Both Wolfe and Montcalm were slain in the battle. Monuments to commemorate these commanders were erected in Quebec. A monument also commemorates Gen. Wolfe in Westminster Abbey.

Wolfe, THOMAS CLAYTON, writer, born in Asheville, N.C., 1900; died in 1938. After his graduation from the Univ. of North Carolina (1920),

Courtesy Brown Bros., N. Y.

JAMES WOLFE

Courtesy Scribner's Sons, N. Y.

THOMAS WOLFE

he became an English instructor at New York Univ. (1924-30). His untimely death cut short a brilliant writing career. He had not yet reached his prime, yet the emotional depth and intensely detailed quality of his largely autobiographical stories and novels established him as one of America's most gifted authors. Among his best-known works are: "Look Homeward, Angel" (1929), "Of Time and the River" (1935), and the posthumously published "The Web and the Rock" (1939), "You Can't Go Home Again" (1940), "The Hills Beyond" (1941), and an edition of his letters in 1943.

Wolf-Ferrari (*vôlf′fär-rä′rē*), ERMANNO, composer, born in Venice, Italy, in 1876; died in 1948. Although he showed musical talent at an early age, his father, a painter, sent him to Rome and Munich to study art. In Munich, however, Wolf-Ferrari turned definitely to music, studying with Josef Rheinberger. His first major composition, the oratorio *"La Sulamite,"* had its first performance in Italy, while his first opera, *"Le Donne Curiose"* (The Inquisitive Women), received its première at the Munich Court Theater in 1906. His one-act opera "The Secret of Suzanne," first performed at Munich in 1909, spread his fame throughout Europe. His next opera, "The Jewels of the Madonna," first given in Berlin in 1911, established his reputation in America, for in 1912 he personally supervised its American première in New York. Although numerous later works followed, such as the symphonic poem *"La Vita Nuova"* (The New Life), the operas *"La Vedova Scaltra"* (The Cunning Widow) and *"La Dama Boba"* (The Foolish Lady), as well as chamber music, piano pieces, and cantatas, Wolf-Ferrari will be perhaps best remembered for "The Secret of Suzanne" and "The Jewels of the Madonna." Both of these show how greatly he was influenced by Richard Wagner (*q.v.*) and how strongly, despite this influence, he was anchored in the tradition of classical Italian opera.

Wolf Fish (*wŏŏlf′ fĭsh*), a fish found in the North Atlantic, so called from its voracious and carnivorous habits. It has a large mouth and strong teeth and bites savagely when caught by fishermen. The Icelanders catch it for food, using it both fresh and salted, and a kind of shagreen is made of the skin. The common wolf fish is from 5 to 7 ft. long. Several species are caught off the shores of Norway and Great Britain.

Wolframite (*wŏŏlf′rạm-īt*), a series of tungsten ores which are intermediate between the iron tungstate, feberite, $FeWO_4$, and the manganese tungstate hubnerite, $MnWO_4$. The wolframites $(FeMn)WO_4$, contain about 76.5 per cent of tungsten, and are one of the principal sources of the metal tungsten. In color they are dark gray, black, or reddish brown, with a resinous appearance. Their specific gravity is 6.8 to 7.55, and their rating on the hardness scale (*q.v.*) from 5 to 5.5. They are frequently found in granite or quartz veins, in veins with gold, copper, or other minerals, or with tin ores. Wolframite is the ore from which tungsten gets its chemical symbol of *W*. The Swedish chemist Scheele, in 1781, isolated tungstic acid, WO_3, from scheelite ore, but shortly afterward the same acid was identified in a mineral called "wolfram" by miners in the Cornish tin mines. Though the name tungsten persisted for the element, the symbol *W* from "wolfram" was adopted for it. Wolframite is found in the Western U.S., in Connecticut, New Hampshire, and Virginia; and in England, Portugal, Argentina, Chile, Australia, and India.

Wolfram von Eschenbach (*vôl′främ fôn ĕsh′ẹn-bäḵ*), German minnesinger, lived *ca.* 1165-1220. Born in Bavaria, he led the typical life of the German minnesingers, traveling from court to court, sojourning rather frequently at the court of Hermann, Landgraf of Thuringia. These stays gave the motif to Richard Wagner's famous opera "Tannhäuser," which is built around his competition with other contemporary minnesingers. Of his epic poems, the "Parzival" is the most famous, describing the story of the search of the Grail (*q.v.*), the celebrated sacred chalice. Eschenbach's "Parzival" again became the motif for another Wagnerian opera, the "Parsifal."

Wolseley (*wŏŏlz'lĭ*), SIR GARNET JOSEPH, military leader, born near Dublin, Ireland, June 4, 1833; died Mar. 25, 1913. He entered the British army in 1852 for service in the Burmese War, in which he was seriously wounded. The following year he took part in the Crimean War, receiving severe wounds at Sebastopol, and from 1857-58 commanded as major at Lucknow during the mutiny in India. He served as lieutenant colonel in the Chinese War of 1860 and as a colonel in the army of Canada from 1862-70. From 1873-74 he commanded as major general in the Ashanti War, and served in South Africa in 1879 and in the Egyptian campaigns of 1882. His army captured Arabi Pasha at Tel-el-Kebir, for which he received the thanks of Parliament and was made a general and baron. In 1890 he became commander-in-chief of the army in Ireland, and in 1895 attained to the chief command of the British army. He published "Life of John Churchill, Duke of Marlborough," "The Decline and Fall of Napoleon," and "Narrative of the War with China."

Wolsey (*wŏŏl'zȳ*), THOMAS, cardinal and statesman, born in Ipswich, England, *ca.* 1475; died in London, Nov. 29, 1530. He studied in Ipswich and later at Oxford Univ., where he received the degree of master of arts. He was appointed a teacher of the grammar school connected with Magdalen Coll., Oxford, and later became rector at Lymington. He was appointed chaplain to Henry VII through the recommendation of several friends, particularly that of Bishop Fox, of Winchester. From that time on, he rose rapidly to power. In 1508, the king sent him as ambassador to Emperor Maximilian and subsequently showed favor toward him with other appointments, especially the deanery of Lincoln. Henry VIII, who came to the throne in 1509, held him in the same high esteem, and he was made a member of the king's privy council in 1511. He became bishop of Tournay (1513) and bishop of Lincoln and archbishop of York (1514). When the Archbishop of Canterbury resigned as lord chancellor (1515), together with all the rest of the king's councillors, Henry VIII made Wolsey lord chancellor; thus he became the sole adviser to the sovereign, with practically the whole power of government in his hands.

THOMAS, CARDINAL WOLSEY

Wolsey used his power in the struggles between Emperor Charles V and Francis I of France to increase the importance of England and Henry VIII in Europe. Although actually England gained through his political schemes, he was by no means motivated solely by patriotism, but used his position much to his own advantage. Thus, he accepted a pension of 12,000 livres from Francis I in 1518; in return he relinquished the bishopric of Tournay. He became a cardinal (1515) and a legate of the pope, with a pension of 7,500 ducats, in 1518.

A great lover of display, he occupied the palace of York Place, now Whitehall, and freely expended his revenues. He ruled the English clergy completely through his own law court, which he himself instituted. He confiscated the abbey of St. Albans and the bishoprics of Bath, Wells, Durham, and Winchester because of their rich revenues. His income actually became larger than that of the crown.

Finally, after he had accepted much favor and remuneration from both Francis I of France and Emperor Charles V, he decided in favor of the latter—hoping the emperor would succeed in making him pope as he had promised—and declared war against France in 1521. Twice disappointed in his hope for the papacy, Wolsey made peace with France in 1525. In 1528 he changed sides once again by declaring war on the emperor. However, this participation of England in the struggle against Charles V came much too late to forestall an imperial victory, and the Peace of Cambrai (*q.v.*), which Charles V and Francis I signed in 1529 left England at a low level of influence in continental affairs.

Wolsey's decline began when he lost royal favor for his failure to secure the pope's permission for Henry's divorce from Queen Catherine so that he might marry Ann Boleyn. The failure was due to the opposition of Charles V, nephew of the queen. Wolsey was driven from court in 1529 and his estates were confiscated. Soon afterward he retired to his diocese in York. His ability and affable manner won friends among the people and the king relented and restored him to some of his offices. His enemies, however, feared that he would again succeed to almost supreme power. After he had been accused in Parliament of misuse of his clerical powers, he was arrested on a charge of high treason. Henry pardoned him, but he was accused again on the same charge in 1530. Before he was brought to London, he died at Leicester Abbey.

Wolsey owed his success to his combination of worldly shrewdness, diplomatic facility and a sharp legal mind. It is easily understood therefore that he was the most colorful personality of the court of Henry VIII. The tremendous power of his appearance has been eternalized by the drawings and paintings of Hans Holbein (*q.v.*).

Wolsey founded a college at Ipswich, projected Christ Church Coll. at Oxford, and built the palace at Hampton Court.

Wolverhampton (*wŏŏl'vẽr-hămp-tŭn*), a city in the county of Staffordshire, England, situated on the edge of the industrial Midlands about 12 m. N.W. of Birmingham. The city is served by both the Great Western and the London, Midland & Scottish Rys., and three canals link it with important seaports. Rich coal and iron deposits in the neighborhood have made it an important manufacturing center; in steel its industries range from hardware and small goods to heavy industrial machinery. There are also rubber, paint, and varnish works, and one of the largest rayon factories in Europe. The most famous building is the Church of St. Peter's, founded *ca.* 994 A.D. by Lady Wilfrun, a relative of Ethelred II; the church is Perpendicular in style and has many historical monuments. The boys' grammar school was founded as early as 1512. Population, *ca.* 146,000.

Woman's Christian Temperance Union (*wŏŏm'ạnz kris'chạn tĕm'pẽr-ạns ūn'yŭn*), a national and international organization of women, organized at Cleveland, O., in 1874. It is the outgrowth of the Woman's Crusade, inspired by lectures given by Dr. Dio Lewis in 1873, and conducted to suppress the liquor traffic. The principal object of the society is to secure social reform and to abolish the sale of liquor, as well as to teach total abstinence. Membership is open to all races and religious creeds. The union has 8,000 local unions, including a branch for children and one for youth. Total membership is over 500,000. The union has been instrumental in obtaining the passage of state laws which require teaching the effects of stimulants and narcotics on the human system and has exercised a wide influence in obtaining better protection of girls and women, in the appointment of police matrons, and in establishing houses of refuge for erring women. Conventions are held annually by the national organization. Evanston, Ill., is the headquarters of the society, and *The Union Signal* is its official organ; *The Young Crusader* is published for boys and girls.

Woman's Rights (*wŏŏm'ạnz rīts*), the term commonly applied to the idea that privileges for women should be on a basis of equality with men, in political, social, and professional life.

The limiting of women's activities to homemaking and child-rearing was common from the beginning of civilization until the 19th century. In prehistoric times women dominated the primitive tribal communities, but when the family replaced the tribe as the basic social unit, the woman had status only as a wife and houseworker, subservient to the husband, in law and in practice.

Women began to attain a degree of equality after modern large-scale industry opened new fields of activity, and modern thought projected new concepts of democracy. Leaders of the French Revolution first upheld women's political rights in 1792, and the Chartist Movement took a similar stand in Great Britain in 1838. Education, which had been the exclusive privilege of men, eventually became available to women. The first girls' school in the U.S., Emma Willard's Female Sem., was established in 1821; Mt. Holyoke Sem. was founded in 1838, Vassar Coll. in 1865. Schools and colleges in other countries opened their doors to girls. In England, the Education Act of 1870 made education compulsory for both girls and boys.

The organized movement for woman's rights was launched at a convention in Western New York—the first of its kind in any country—called in 1848 by Quakers, who for long had championed equality of the sexes. At a succeeding convention, in 1850, Lucy Stone (*q.v.*) came to the fore as a woman's rights leader in the U.S. Susan B. Anthony (*q.v.*), active in the cause in this country from 1852 until her death in 1906, organized the National Woman's Suffrage Association in 1868. Public ridicule and opposition finally gave way before the stubborn and increasingly strong forces of the movement, and in 1920 American women were given the right to vote and to hold office, under the 19th Amendment to the Federal Constitution.

In England the agitation for woman's rights was marked by violence. Richard and Emmeline Pankhurst (*qq.v.*), enlightened English reformers, had begun to rally public opinion in behalf of votes for women toward the end of the 19th century. After Pankhurst's death in 1898, Mrs. Pankhurst and their daughters, Christabel and Sylvia Pankhurst, became militant leaders of the movement. Numbers of women were jailed for public demonstrations beginning in 1906. Emmeline Pankhurst was repeatedly arrested but defied the authorities by conducting hunger strikes in English jails.

Limited franchise was won for women in Great Britain in 1918, and the Sex Disqualification Act of 1919 permitted women to hold public office and to serve as jurors in courts of law. Full equality at the polls was granted to English women under another act of Parliament in 1928. One by one, discriminatory laws governing marriage were revised in Great Britain: divorced mothers were given the right to have custody of their children in 1925; wives were permitted under the Matrimonial Causes Act of 1938 to sue for divorce on grounds of infidelity, desertion, cruelty, or insanity—a legal remedy which until then had been available only to husbands.

Women in the 20th century have come to have a considerable share in the industry and politics of many countries. Legislation in the democratic countries now protects their basic rights as workers, although minimum wages, seniority rights, and other conditions of work for women are generally below the standard set for men. In 1940 one-quarter of all American wage-earners were women; by the end of 1943 one-third were women, due in part to the manpower shortage during World War II. Meantime, population changes were such that by 1944 America's cities contained more women than men.

Victory for the United Nations in World War II was due in part to the unprecedented mobilization of women, not only in defense industries but in the armed services. Approximately 250,000 American women were members of auxiliary corps of the country's armed services. In the United Kingdom an estimated 7,000,000 women were in auxiliary military services or worked full-time in civilian defense or in war industries. In Paris in 1944 women joined with men in the French Forces of the Interior waging guerrilla warfare against the Germans. Women in the Soviet Union battled as guerrilla fighters and as regular soldiers in the Red Army, as well as working on every level of production in their country's wartime economy.

Before World War II the growth of the woman's rights movement suffered a setback in Nazi Germany and other countries under similar regimes, where obsolete ideas concerning woman's inferiority were revived. However, since the war women in many parts of the world have gained new freedom. French women went to the polls for the first time in 1946. Even in Japan, where women formerly had been accorded almost no rights, they voted along with men in April 1946, and of the 466 parliamentary seats filled in the Japanese elections, 38 went to women.

One of the goals of the United Nations, as set forth in the charter, is "to reaffirm faith . . . in the equal rights of men and women." The policy throughout the various organs of the United Nations is to do away with distinctions of sex, as well as of race, religion, etc. Women not only serve with men in all branches of the world organization, but they have their own Subcommission on the Status of Woman, a subdivision of the United Nations Economic and Social Council's Commission on Human Rights. See also *Women's Bureau.*

Womb (*wo͞om*). See *Uterus.*

Wombat (*wŏm′băt*), an Australian marsupial, which somewhat resembles a small bear. The legs are short and strong, the head is large and flat, the body is broad and depressed, and the tail is rudimentary. Several species are native to Southern Australia and Tasmania, but all are nocturnal in their habits. The body is 2 to 3 ft. long. They range in color from gray to brownish black. The day is spent largely in sleep, but at night they come forth in search of food, which consists mostly of roots and other forms of vegetation. Three or four young are brought forth at a birth and are carried for some time in the marsupium or pouch. They are animals of little intelligence and are not harmful unless they are provoked. The flesh is highly esteemed for food, its flavor resembling that of pork.

Women in Industry (*wĭ′mẹn*). See *Women's Bureau.*

Women in the Air Force (abbreviated WAF), an integral branch of the U.S. Air Force authorized by the passage of the Women's Armed Services Integration Act of 1948. During World War II, 40,000 Air WACS served with the Army Air Forces. Following the war, in September 1947, a separate military service, the U.S. Air Force, was created with a status coequal to that of the Army and the Navy. Nine months later, in June 1948, the WAFS were established and integrated with this new service.

Beginning with a small nucleus of women who had World War II experience in the Army, Navy, Marines, or Coast Guard, the WAF gradually increased in numbers until by mid-1949 its strength was 2,600. In 1952 (during the Korean conflict), its numbers reached 13,500. Its strength in 1958 was about 600 officers and 8,000 enlisted women.

The WAFS are assigned to all Air Force duties except those sociologically or psychologically unsuitable for women and those beyond their physical strength. They are not permitted by law to fly aircraft engaged in combat.

The WAFS are trained at Lackland Air Force Base, San Antonio, Texas. Through the Air Force Reserve Officer Training Corps, college women may become officers at the following colleges: Butler Univ., Indianapolis, Ind.; Univ. of Maryland, College Park, Md.; Miami Univ., Oxford, Ohio; George Washington Univ., Washington, D.C.; Pennsylvania State Univ., University Park, Pa.; Southern Illinois Univ., Carbondale, Ill.; Univ. of Omaha, Omaha, Nebr.; Univ. of California, Los Angeles, Calif.; Univ. of Florida, Gainesville, Fla.; and Univ. of Texas, Austin, Texas.

Women in the Armed Forces, women who were accepted for enlistment in the armed forces of the U.S. during World War II. The Army, the Navy, and the Marines maintained women's auxiliaries, and almost 300,000 American women served in these divisions before the end of World War II. In addition, about 68,000 women served in the Army and the Navy Nurse Corps during the war. The enrollment of women in the regular armed forces was permitted by the Women's Armed Services Integration Act of 1948. See also *Women in the Air Force; Women in the Marine Corps; Women in the Navy; Women's Army Corps.*

Women in the Marine Corps, an integral branch of the U.S. Marines since 1948. The first such reserves were formed in August 1918, when some 300 women became clerks. Reorganized in February 1943, the Women Marines met their authorized quota of 18,000 enlisted women and 800 officers by June 1944. In World War II they served on all major posts and stations in the U.S. and Hawaii. By September 1946, all but 200 women had been returned to civilian life. As of Jan. 31, 1955, there were about 150 officers and 2,200 enlisted Women Marines on active duty; organized reserve strength was about 35 officers and 575 enlisted women. Most Women Marines serve in the continental U.S. and Hawaii, but some serve in Europe.

Marine recruits receive eight weeks of basic training at Marine Corps Recruit Depot, Parris Island, S.C. Officers train at Marine Corps Schools, Quantico, Va. Occupational fields that employ Women Marines include personnel and administration, operational communication, food services, disbursing, photography, and aerology.

Women in the Navy, an integral branch of the U.S. Navy since 1948. Authorized by Congress in July 1942, so that women might fill jobs in shore establishments and release officers and men of the Navy for duty at sea, the branch provided the first opportunity for women to serve as officers in the Navy. (In World War I some enlisted women held clerical jobs.) The name WAVES came from a document which defined members of the corps as "Women Accepted for Volunteer Emergency Service."

Women officers received basic indoctrination on the campus of Smith Coll., Northampton, Mass., and at Mt. Holyoke Coll. in South Hadley, Mass. The greater number of enlisted women received recruit training at the U.S. Naval Training School established on the campus of Hunter Coll. in New York City. Following basic indoctrination, many women were ordered to specialized schools (aviation, supply, hospital work, and communications), the curricula of which duplicated those set up for men.

The WAVES reach their numerical peak in July 1945, when there were *ca.* 86,000 officers and enlisted women on active duty at 900 naval stations in the U.S. and Hawaii. After the gradual demobilization at war's end, some 2,300 women remained on active duty as of Jan. 1, 1948. In addition, *ca.* 8,000 officers and 8,200 enlisted women became part of the Inactive Reserves. In 1957 there were 2,831 officers and 4,837 enlisted women on duty in naval posts at home and overseas.

Enlisted women serve principally in such job fields as administrative and clerical work, supply, communications, aviation, and hospital work. Officers are commissioned in the Supply Corps, the Medical Corps, the Dental Corps, and the Medical Service Corps. Line officers fill a variety of billets in such fields as personnel, administration, public relations, communications, intelligence, foreign languages, special services, and training. Staff officers are assigned duty in their specialties, such as dietetics, therapy, medicine, dentistry, psychology, aviation physiology, and hematology.

Women's Army Corps (*wĭm'ĕnz*), an integral branch of the U.S. Army since 1948. The corps was organized in May 1942 as the Women's Army Auxiliary Corps, when a shortage of manpower created the demand for the administrative and technical skills of women. In September 1943 it became the Women's Army Corps (abbreviated WAC), a component of the U.S. Army.

During World War II, more than 150,000 women served in the WACS in the U.S., Europe, Africa, the Southwest Pacific, China, India, Hawaii, the Philippines, and Alaska. In 1958 there were *ca.* 8,500 WACS on active duty and 2,000 officers and enlisted women in the Army Reserve not on active duty.

The WACS receive basic training at the U.S. Army Training Center, WAC, Ft. McClellan, Ala., and then go on to attend Army schools throughout the country to train for specialized work. Army schools include Finance, Signal, Adjutant General, Information, Intelligence, Quartermaster, Engineer, Medical, Chemical, and Food Service. Additional courses are available to WAC officers after they attend the WAC Officer Basic Course at Ft. McClellan. They may attend various high-level Army schools open to both men and women.

Women's Bureau, a branch of the U.S. Dept. of Labor, the Federal agency responsible for promoting the welfare of the 24,000,000 women workers of the U.S. The Women's Bureau was created as a permanent agency in June 1920, by an act of Congress; it was an outgrowth of the temporary Woman In Industry Service of World War I. The purpose of the bureau as laid down by Congress is to formulate standards and policies to promote the welfare of wage-earning women, improve their working conditions, increase their efficiency, and advance their opportunities for profitable employment.

In 1920 women gainfully employed, who were 14 years of age and over, numbered 8,229,000, or 23 per cent of the total female population in that age group. In the next two decades, both the numbers and the percentages increased steadily. By 1930, 10,396,000 women who were gainfully occupied constituted 24 per cent of all women in the nation, and by 1940, the number in the labor force totaled 13,840,000, and one in every four women was a worker. The war years brought spectacular increases. In July 1944 the female labor force reached an alltime high of 20,430,000: two in every five women were working or looking for work. Women also achieved another wartime record: they became, for the first time in history, more than a third of the nation's labor force, exclusive of the armed services. Withdrawals following V-J Day caused a steady decrease of women workers to a postwar low of 15,910,000 (February 1947). Since then, however, the female labor force has been steadily growing; the annual average number of women workers in 1948 was 17,583,000; in 1949, 18,030,000; in 1950, 18,657,000. In 1961 there were 24,225,000 women workers, and they made up one-third of the nation's labor force.

The "average" woman worker is no longer a young single girl. In 1900 the median age of women in the labor force was 26; by 1950, it had increased to 37; and by 1962, to 41. In 1900 the bulk of the woman labor force was composed of single women. Gradually, more and more married women have entered the labor market, until in 1947, for the first time, there were more married women workers than single women workers. By 1961, 55 per cent of the female labor force were married (and living with husbands), compared to the 23 per cent who were single. The percentage of married women who worked in 1940 was 15; in 1961 it was 33. Married women usually enter the labor force at a later age than do single women, primarily because the demands of child care keep them home longer. In 1961, 29 per cent of married women (with husbands living at home) between the ages of 25 and 35 were working; 40 per cent of the women between the ages of 35 and 55 were working. Of all mothers with children under 18 years of age, one third were working in 1961. Many wives and mothers find the best solution to their employment needs in parttime work, defined as less than 35 hours a week. Women form 60 per cent of the parttime labor force; and in April 1962, 6,130,000 women worked at parttime jobs, chiefly as household workers, farm laborers, and saleswomen.

Occupations of Women Workers

Expansion in employment has been accompanied by a marked increase in the number and variety of job opportunities that have been made available to women. In the latest census (1960), women were reported in all 479 individual occupations listed, although they were mainly concentrated in a few groups. More women are being employed in areas where their skill and education are important.

World War II created drastic occupational shifts in many fields. Household employment, which for 70 years was the leading occupation among employed women, dropped to fifth place by 1958. Women who for years had accepted low wages and undesirable working conditions now had an opportunity to go into factories where their services were more fairly rewarded.

The war had a similar effect on women's employment in the other service fields, such as laundries, restaurants, beauty shops, hotels, etc. Postwar declines in factory employment forced many women back into the service industries and into household employment, but occupational statistics show that in April 1962 the first five major occupation groups for women were: (*1*) clerical and kindred workers; (2) service workers, except private household; (*3*) operatives and kindred workers (factory production workers); (*4*) professional and semiprofessional workers; (*5*) private household workers.

Clerical Workers: The largest occupational field among women is the clerical and kindred group, which became prominent as a women-employing field about 1910. Since that time, increases in this field have been rapid. In 1940 there were 2,530,000 female clerical workers; in 1950, 4,539,000; and in 1962, 6,948,000; or 31 per cent of all employed women. This large increase is directly related to the expanded activities of business and financial corporations, mail-order and retail shops, government operations, etc.

Service Workers: There has been a steady increase in the number of service workers—from 1,350,000 in 1940 to 2,168,000 in 1950. In 1962 the number rose to 3,364,000, of whom 1,295,000 were waitresses and cooks (not in private homes).

Factory Workers: The number of women in factory and other operative occupations rose from 2,190,000 in 1940 to 3,215,000 in 1950, owing primarily to the demands of World War II and the high-level economy of the postwar period. In 1962 the number continued at *ca.* 3,290,000, re-

Photos in this series courtesy Women's Bureau, U. S. Dept. of Labor

WOMEN IN INDUSTRY AND THE PROFESSIONS

Employment opportunities for women have broadened in the last decade to include many jobs in heavy industry as well as in consumer-goods production. Women have also found their places in laboratories, research departments, radio and television, publishing, advertising, and related fields

flecting changed economic conditions, technical advances, and increased use of automation, which limit job opportunities.

Professional and Semiprofessional Women: During the 19th century, women's employment in the professions was confined largely to teaching and nursing. In 1870 about nine in every ten professional women were teachers or college educators. Seventy years later, teachers and college educators had dropped to about 55 per cent of the total number of women in professional work, and women were found in a wide range of professions. In 1940 there were 1,570,000 professional women employed; in 1950, 1,862,000; in 1962, 2,941,000. In 1962 teaching was still the most popular profession, but the 1,258,000 teachers accounted for only 43 per cent of the professional women population. Nurses and other medical workers were the second-largest professional group; their 776,000 workers made up 26 per cent of the professional group. Other fields of professional interest are music, accounting, social work, libraries, editing and reporting, and, in slowly increasing numbers, law, engineering, and architecture.

Private Household Workers: Household workers, who numbered 2,100,000 in 1940, found more lucrative employment in factories during the war, and in 1950 their number had fallen to 1,771,000. The decline in factory opportunities in the 1950's forced many of them to return to household work, although some of their number were siphoned off into the service field. The rate of increase for household workers was slow, however; their number in 1962 stood at 2,275,000.

INCOME

The presence of an increasing number of women in the country's labor force is directly related to their economic need for gainful employment. Practically all of the women workers without husbands were supporting themselves, and often dependents as well. Most of the married women were contributing to essential living expenses. Some were working to raise the family living standard, and some were helping to send their children to college. A very few women were working just for the satisfaction of having a job.

Women have a lower income, in general, than men because they hold different types of jobs. Because of their education and training, they are working primarily in low-wage, nonskilled industries. Sometimes they are paid at lower rates than men for the same job. Efforts for equal pay are being made through legislation, collective bargaining, and public education.

Women's income reflects the skills, knowledge, and education required in a job. Year-round, full-time women workers in 1960 received their highest median earnings ($4,384) in professional occupations. Managers, officials, and proprietors received $4,173; clerical workers, $3,586; factory workers, $2,970; saleswomen, $2,428; service workers, $2,418; and household help, $1,133. Job opportunities and income are directly influenced by the length and type of education an applicant can offer; and the educational level of the working woman has been rising steadily. In 1959, 18 per cent of the female labor force had attended college, and almost half of this group had four or more years of higher education; 38 per cent of all women workers were high school graduates; and another 19 per cent had attended high school.

Bureau Services for Women Workers

Providing factual information about women workers is one of the basic means by which the bureau promotes their welfare. The bureau develops definite programs of action through which desirable working conditions for women can be achieved. While it administers no laws, the bureau makes thorough studies of existing laws and administrative procedures and promotes good labor legislation applying to women. The major types of legislation on which the bureau compiles data and gives assistance are equal pay, minimum wage, hours of work, and laws related to the political and civil status of women.

Twenty-two states have equal-pay laws, requiring that women be paid the same rates as men for comparable work; and 33 states, the District of Columbia, and the Commonwealth of Puerto Rico have minimum-wage laws. These states receive assistance from the bureau in revising orders and administering programs. Groups in other states which are interested in enacting similar legislation may receive factual material and technical assistance from the bureau.

In the international field, the bureau serves as a consultant for similar agencies in other countries. The bureau's consultative work has also played an important part in establishing women's bureaus in foreign countries.

Women's Clubs, GENERAL FEDERATION OF, an international organization founded in 1890 with the aim of uniting the women's clubs and societies throughout the world for their mutual benefit and in order to promote their common interest in education, philanthropy, public welfare, moral values, civics, and fine arts. It has 800,000 direct members in 15,000 clubs in the U.S., and an aggregate membership of about 11,000,000 in the U.S., its possessions, and 50 foreign countries. The work of the federation is carried on through departments, divisions, and committees, which have changed through the years to meet varying conditions. In the period 1958-60, the departments of work were: American home, communications, community affairs, conservation of natural resources, education, fine arts, international affairs, public affairs, and the Council of International Clubs. National headquarters of the General Federation are located in Washington, D.C.

Women Voters of the U.S. (*wĭm'ẹn*), LEAGUE OF, a nationwide, nonpartisan organization established in 1920 with the purpose of stimulating citizen participation in government. The central idea of the league's work since its origin has been the strengthening of a democratic society through the political education of its citizenry. The program of the league, as set forth at the national conventions, includes such questions as the expansion of world trade and international economic development, the study of the Federal loyalty-security program, and national water resources. This work is carried on through study, discussion groups, cooperation with other organizations, voters' booths, and public meetings. The league, with headquarters in Washington, D.C., has a total membership of *ca.* 127,000, distributed among 1,080 local groups, in 50 states and the District of Columbia.

Wood (*wŏŏd*), a firm but porous material which is the content inside the bark or skin of the stem, branches, and roots of trees. It is composed of various chemical elements, some in combinations which form two substances known as cellulose and lignin in the structural shape of cellular fibers. Other substances entering in varying amounts into the composition of wood include water, coloring matter, mineral salts, and sometimes resin.

The cellular walls are made of bundles of cellulose fibers which exist in conjunction with lignin. The chemical formula for cellulose is $(C_6H_{10}O_5)_x$. Lignin exists in several forms, with an average composition of approximately

63 per cent carbon, 6 per cent hydrogen, and 31 per cent oxygen, by weight. The approximate average atomic proportions are: carbon, 11; hydrogen, 12; oxygen, 4.

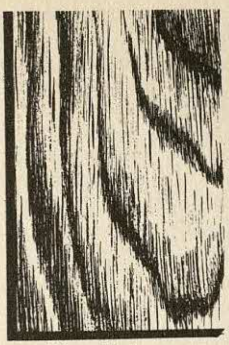
Principal elements in wood are carbon, oxygen, hydrogen, nitrogen, potassium, calcium, magnesium, phosphorus, and sulfur.

Trees will grow wherever soil and climatic conditions are favorable, except to the extent that man diverts the land to other purposes such as the growing of food crops. See *Forest; Forestry.*

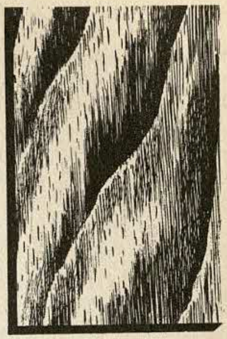
According to the kind of trees they contain, forests are divided into three classes: (1) those in which the predominant species are *gymnosperms;* (2) those in which the principal species are *angiosperms;* and (3) forests in which these two types are generally mixed. Gymnosperms are the cone-bearing trees, such as the pines and firs. In commercial parlance, they are also known as "softwoods." Angiosperms are the broad-leaf trees. They include two groups, *monocotyledons,* such as palm trees, and *dicotyledons,* such as oaks, maple, mahogany, and cottonwood. The dicotyledons are known commercially as "hardwoods." However, some softwoods are actually harder than some of the so-called hardwoods, and vice versa. About two-thirds of the world's forests are hardwoods.

The roots of trees extract mineral elements from the soil in liquid solution. This ascends through a layer of cells in the trunk known as the *cambium,* which is just inside the bark. Finally it reaches the leaves where it enters into the chemical process by which cellular material is produced. Through the leaves the tree absorbs carbon dioxide from the atmosphere. When the sun shines on the leaves the light rays strike a green substance called *chlorophyll.* This activates the chemical process that converts carbon, oxygen, and hydrogen into a starchlike substance. Subsequently, the leaves also give oxygen back to the atmosphere, while the converted plant foods are distributed downward to the cambium cells. At this stage, most of the material is used in the cambium to form new cells. These are added to the sapwood just inside the cambium layer, and become new wood. As growth occurs at different speeds to match the seasons, it is marked by differences in the size and color of the cells so that over a number of years growth is shown in a cross-section of a tree as a series of rings, one to each year. While the cambium layer is building new cells onto the sapwood, it also is adding other cells to the inside of the bark. In this manner, the growth of the bark keeps pace with the expanding circumference of the tree.

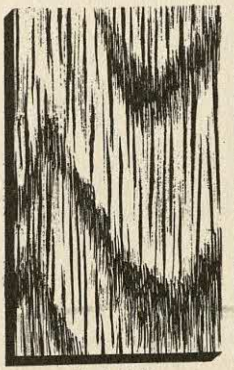
In America, softwoods are more widely used than hardwoods, as they grow more rapidly and are more easily adapted to a wide range of uses. As a rule, they are more easily sawed or cut for



True Mahogany



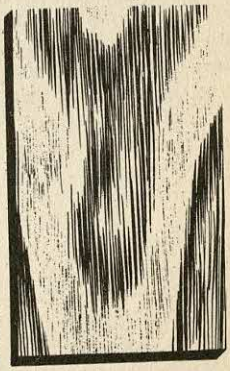
Circassian Walnut



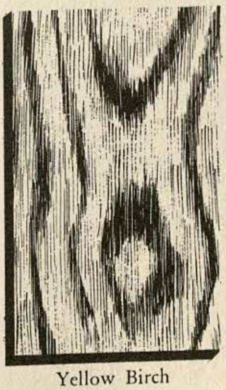
Red Oak

Red Maple

Black Cherry



Chestnut



Yellow Birch

American Elm

SAMPLES OF WOOD GRAINS

lumber and plywood. Also, they are more readily "digested" into pulp, as for the manufacture of paper. Principal species of softwoods used for lumber are the several varieties of Southern pine, Douglas fir, ponderosa pine, white pine, and hemlock. The principal species used for plywood (*q.v.*) is Douglas fir. Leaders in conversion to pulpwood are Southern pine, spruce and hemlock. Despite the larger use of softwoods, hardwoods are preferred for numerous purposes. Oak, for example, is a favored wood for flooring and for numerous other purposes requiring hardness and strength. Walnut is highly prized as a cabinet wood. Both oak and walnut, and several other hardwoods, are the principal materials of most furniture making. As a rule, most native hardwoods and most imported hardwoods, such as mahogany, are used in the form of veneers for furniture and cabinet making. In this form, they consist of very thin slices which are glued to the surface of less beautiful wood. In modern technique, the glues used for such purpose provide a binder which is stronger than wood itself, and when so specified can also be waterproof.

Wood is probably the world's most used building material. In the U.S., approximately 80 per cent of all structures are built primarily of wood. Americans use more wood as lumber than for any other purpose. The second largest use of wood is as fuel. Other large uses include fence posts, poles, piling, shingles, railroad ties, and mine timbers. Large quantities of wood also are used in the form of veneer and plywood. In addition, vast amounts of wood are ground into small fibers, and by various processes are converted into fiber board, paper, rayon, and numerous plastics. These processes have also been extended to include the manufacture of sugar and starches from sawdust or other ground wood, and their subsequent conversion into alcohol, protein feed, synthetic rubber, and other products.

Wood chemistry foresees tremendous changes in the raw materials field, particularly with the advent of scientific forest management looking toward perpetuation of self-replenishing forest land.

Wood, in its natural state, may now be treated with chemical solutions to stabilize it in permanent shape, make it rot-resistant, fire-resistant, and waterproof. Wood, treated with urea-aldehyde, may be tied in knots and retain that form. Veneers, plywoods, and laminates employ the natural form of wood, while trade-named products such as Prestwood, Pluswood, or Masonite are chemical adaptations.

Veneer is wood which has been sliced, sawed, or peeled into a sheet of relative thinness. It is possible to make it as thin as a sheet of paper, or it may range upward to 5/16 of an inch. It may be used in individual sheets for the manufacture of boxes and baskets and a number of other purposes, or it may be glued to other wood to form a laminated material. In the manufacture of furniture, considerable quantities of veneer obtained from hardwoods are used as surface materials after having been glued to less expensive and more workable woods.

Plywood consists of at least two strips of veneer, but generally three or more, which have been bonded together with the grain of the wood in some of the sheets running lengthwise, while the grain in the alternate sheets runs diagonally or crosswise, generally the latter. Most veneer for plywood is peeled by long knives from logs rotating on large lathes. In this manner a virtually continuous sheet can be cut, with a width as great as that of the knife and lathe—usually 8 ft. or more. While the peeling is being done, another step in the process clips the sheet into panels, the commonest size of which is 4 ft. wide and 8 ft. long. Then the alternate layers are glued, assembled, and pressed together until the binding material is solid. Heat is also usually applied in this process.

It is also possible to apply pressure and heat to resin-bonded layers of veneer to such an extent that the original thickness may be reduced as much as two-thirds. This results in an alteration of the cellular structure of the wood, and yields a product which is harder and stronger than the original material. This is known as compregnated wood, or compreg.

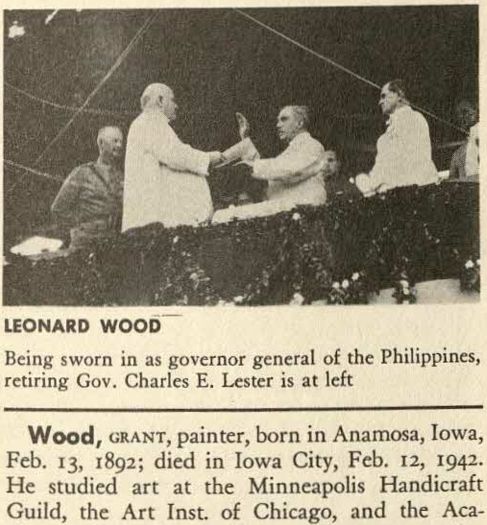
Glues are also used to join strips of lumber, in assorted lengths, to form laminated timbers which can be made to any desired length, and in patterns curved as well as straight. This process makes it unnecessary to grow trees to an excessive old age in order to get unusually long timbers for special purposes. Also, it enables builders to fabricate such items as the keel of the ship as a "one-piece" unit without any portion having been strained by bending.

Another important technical development in the use of wood in recent years is a ring-shaped metal connector, used with bolts to fasten the abutting ends of timbers. By its use, the joints are made much stronger than is possible when bolts alone are used.

In converting wood into paper and similar products it is first ground in water to a fibrous pulp or chipped and then cooked under pressure and with a mixture of chemicals until it becomes a pulp. If chemicals are used, they are then removed. The pulp is then bleached. Next, it is agitated upon wire-screen surfaces until part of the water has drained off and the remaining pulp is approximately equalized in thickness. In the concluding process, the sheets of pulp are passed through heated rollers which remove the last of the water and press the pulp to the thickness of paper.

To make rayon (*q.v.*), wood is reduced to a pulp and then its cellulose is dissolved by chemicals. When this solution is extruded through tiny holes, under conditions favorable to solidifying, it forms rayon threads.

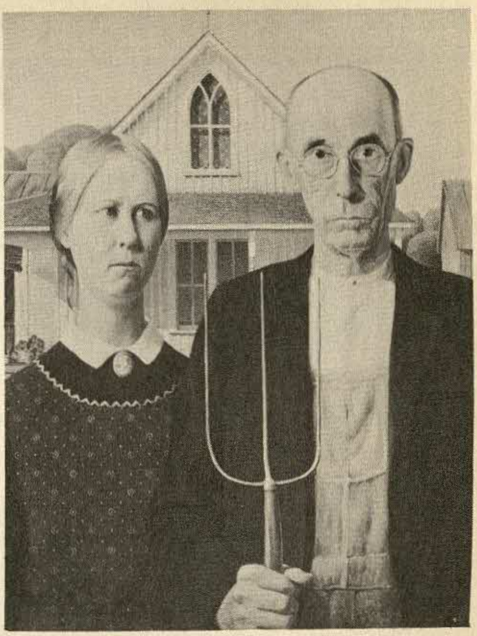
In the manufacture of wood plastics, one type is obtained when chemicals are applied to wood fibers to dissolve the cellulose, forming an amorphous substance which becomes solid when cooled. Another type is obtained by hydrolizing wood to form a powder of cellulose and lignin which may be mixed with small quantities of phenol. This is then solidified by heat and pressure. Despite the widening field of wood utilization, American forests in recent years have been growing new wood almost as rapidly as the rate of consumption. Moreover, there is occurring an expansion of the area of forest growth which indicates that eventually the forests may create new wood as fast as the old is consumed.



LEONARD WOOD

Being sworn in as governor general of the Philippines, retiring Gov. Charles E. Lester is at left

Wood, GRANT, painter, born in Anamosa, Iowa, Feb. 13, 1892; died in Iowa City, Feb. 12, 1942. He studied art at the Minneapolis Handicraft Guild, the Art Inst. of Chicago, and the Académy Julian in Paris, France. He was a craftsman in hand-wrought jewelry and taught art in public schools and other educational institutions. In his paintings, he showed a keen feeling for the Midwestern scene of his day. His paintings—many of which hang in the foremost galleries of the U.S.—include "Stone City" (1930), "American Gothic," which received an award at the exhibition of the Art Inst. of Chicago in 1930, "Victorian Survival" (1931), and "Daughters of the Revolution" (1932).



Courtesy Art Institute of Chicago, photo by The Museum of Modern Art, N. Y.

AMERICAN GOTHIC. PAINTING BY GRANT WOOD

Wood, LEONARD, physician, soldier, and administrator, born in Winchester, N.H., Oct. 9, 1860; died in Washington, D.C., Aug. 7, 1927. He was graduated from Harvard Medical School in 1884 and maintained a medical practice in Boston, Mass., until he became an assistant military surgeon in the U.S. Army in 1886. He took part in encounters with the Apaches under their chief Geronimo (*q.v.*) and for his exploits received the Congressional Medal of Honor. In the Spanish-American War (*q.v.*), he organized the Roughriders (*q.v.*), serving as colonel of the regiment. He became a brigadier general of volunteers in 1898 and in the regular army in 1901. He was chief of staff of the army, 1910-14 and served as military governor of Cuba, 1899-1902, in the Philippines, 1903-08, and as governor of the islands, 1921-27. He showed great political acumen and—though unsuccessfully—sought the Republican party nomination for President in 1920.

Wood, PEGGY (christened MARGARET), actress, authoress, born in Brooklyn, N.Y., Feb. 9, 1892. She was educated in a private school, and her father Eugene Wood, a magazine writer, encouraged her at an early age to write songs and sing them for friends. She started on Broadway in 1911, in the chorus of "Naughty Marietta." She appeared as a singing star in "May-Time" (1917-19) and in other roles in "Clinging Vine," "Candida" (succeeding Katharine Cornell), and "Trelawney of the Wells." She starred in "Bittersweet" (London, 1929), "Blithe Spirit" (New York City, 1941), and in the TV show "Mama" (1949-57).

In addition to her acting activities, Miss Wood has also become known as a writer, and her books include "The Flying Prince" (1921), "The Splendid Gypsy" (1927), "Actors—and People" (1929), and "How Young You Look," an autobiography (1941). She was active in the forma-

PEGGY WOOD

In the title role of "Mama"

tion of the Actors' Equity Assn. and was elected president of ANTA in 1959. She was married twice, to John van Alstyne Weaver in 1924 and William H. Walling in 1946.

Wood, THOMAS WATERMAN, artist, born at Montpelier, Vt., in 1823; died in 1903. After studying art in Boston and abroad, he returned to travel through the U.S., and in 1866 established himself in New York City. He was president of the American Water Color Society from 1878-87, president of the National Academy of Design from 1891-99, and a founder of the New York Etching Club. The Metropolitan Museum of Art, in New York City, acquired three of his paintings ("The Contraband," "Recruit," and "Veteran"), and the New York City Chamber of Commerce bought many others. His pictures were frequently reproduced in contemporary magazines. A permanent collection of his work, including meticulous copies of earlier European masters, was placed on view during the last years of his life at Montpelier, in the Wood Art Gallery, which he founded. At first a portrait painter, he specialized during most of his career in genre painting. His work was typical of the period when illustration, or the visual presentation of a story, was the chief function of art.

Wood Alcohol (*wo͝od ăl'ķô-hŏl*), or METHYL ALCOHOL, a liquid obtained by heating wood in closed retorts, with air excluded. The product resulting from the process involved is a mixture of wood alcohol, ammonia, acetone, and other substances and acids. This mixture is neutralized with slaked lime to separate the acids, after which the wood alcohol is isolated by distillation. In a pure state, wood alcohol is a colorless liquid, has a peculiar aromatic odor, and mixes readily with water in any proportion. It is used extensively in the manufacture of varnishes and to prepare methylated spirit. It is poisonous and should be handled with caution. See also *Charcoal.*

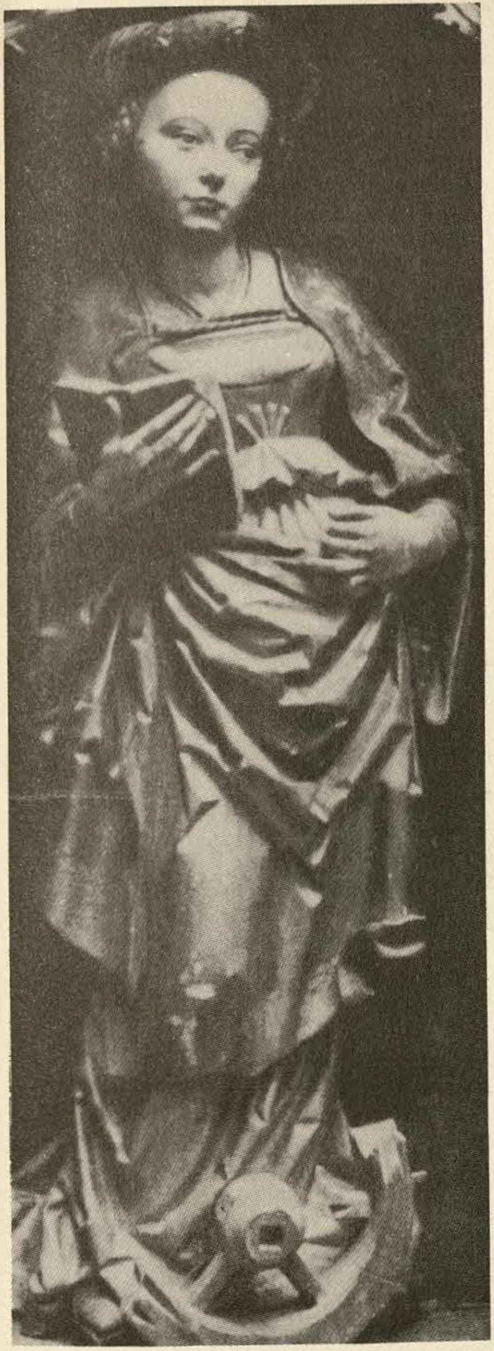
Woodberry (*wo͝od'bĕr-ĭ*), GEORGE EDWARD, poet and educator, born in Beverly, Mass., May 12, 1855; died Jan. 2, 1930. He studied at Harvard, was graduated in 1877, and in the same year became professor of English in the Univ. of Nebraska. In 1878 he joined the editorial staff of the *Nation* in New York City, but returned to the Univ. of Nebraska after two years. He contributed to many magazines and periodicals and in 1891 was made professor of comparative literature in Columbia Univ., which position he resigned in 1904. His books include: "Life of Edgar Allan Poe," "History of Wood Engraving," "Studies in Letters and Life," "Makers of Literature," and "Collected Poems."

Woodbine (*wo͝od'bīn*), the name given in Europe to the honeysuckle, so called from its habit of clinging to and winding around trees. It is a woody climber with deciduous leaves. The fragrant yellow and red flowers are in terminal heads and are succeeded by red berries. This plant has been naturalized in Canada and the U.S. The name woodbine is applied locally to several species of honeysuckles, especially to the *Virginia creeper* (*q.v.*).

Woodbury (*wo͝od'bĕr-ĭ*), LEVI, jurist, born at Francestown, N.H., Dec. 22, 1789; died Sept. 4, 1851. He was graduated from Dartmouth Coll. in 1809, was admitted to the bar, and established a successful practice in his native town. In 1823 he was elected governor of his state as a Democrat, in the following year became a member of the state legislature, and was later elected to the U.S. Senate, where he supported the policies of Andrew Jackson. The latter appointed him Secretary of the Navy in 1831 and three years later made him Secretary of the Treasury, retaining that post until the close of Van Buren's administration, in 1841, when he was again elected to the Senate of the U.S. In 1845 he succeeded Joseph Story as a judge of the U.S. Supreme Court.

Wood Carving (*wo͝od ķär'vĭng*), the art of carving wood into ornamental figures, or decorating it by carvings. The art is one of the oldest and long held an important position among the plastic arts. Specimens of wood carving can be found even among the remains of prehistoric times and many date back to Egyptian times, beginning with the fourth millennium B.C. Not only sculptured figures but also other specimens of carving such as furniture, toilet articles, surface reliefs of plants and animals, and coffin ornamentations, have been obtained from the Egyptian tombs. In Greek and Roman art, wood carving of sculpture played a minor part as compared with sculptures executed in bronze, stone, and ivory. In the construction of large statues whose surfaces were to be covered with ivory and gold, however, wood was used as a nucleus.

In the Middle Ages, fine wood carvings were



WOOD CARVING, EARLY 16th CENTURY

St. Catherine depicted on the wing of a German altarpiece

made to decorate the doorways and altars of churches and many church ornamentations, such as crucifixes. Some of the finest specimens of doorway decorations are to be found in the Scandinavian countries, while exquisite altar decorations in carvings of wood exist in Germany and Spain. The carvings made in England in the Middle Ages were destroyed largely during the Reformation, but there are newer examples at Westminster Hall, St. Paul's Cathedral, and Cambridge.

Carved wooden sculptures, however, which were not at all connected with architectural elements but created as independent works of art, became one of the main artistic expressions of the Middle Ages. The Madonna with Child, saints, even whole groups representing biblical scenes were executed from the 11th to the 16th century in France, Belgium, Holland, and Germany—all of them as great works of art as the simultaneous monumental stone sculptures.

Wood carving as an art was not confined to Europe in modern times, but there are many fine specimens made by the Mohammedans in Damascus, Constantinople, and Cairo. Other fine products of this kind were made by the Hindus, many of which are seen in the temples of India, and by the Chinese and Japanese. The modern wood carvings of China and Japan are counted the finest in the world. Many savage races are skillful in carving, especially the Polynesians, who decorate their canoes, paddles, and huts with finely designed figures. The Eskimos are quite skilled in various kinds of carving, especially in making totem posts.

Woodchuck (*wŏŏd′chŭk*), an animal of the marmot family, native to the eastern part of North America, ranging from Alabama to Hudson Bay. The color is blackish above and chestnut-red below. The body is 14 to 18 in. long and the tail is bushy. Woodchucks are vegetable feeders, subsisting mostly on plants and fruits, and dig burrows in the ground surrounded at the upper part by a ridge so water cannot enter. They may be easily tamed and in a domestic state feed on bread and vegetables. In some sections they prove a pest to farmers in that they burrow on hillsides and destroy clover fields. The flesh is rank, but is eaten in some localities. The woodchuck is popularly called *ground hog.*

Woodcock (*wŏŏd′kŏk*), the name of several birds commonly classed in the same genus as the snipes, but having a bulkier body and shorter and stronger legs than the true snipes. The *American woodcock* is about 11 in. long, with a wingspread of 18 in. It has a short tail and is of a yellowish brown color shaded with black. The woodcock frequents fresh-water swamps, where it searches in the water for insects and worms, but due to its shy habits, it spends most of the time during the day in rushes and woods. The flesh is considered a delicacy. These birds have the peculiar habit of occasionally conveying their young through the air, a trait found only in one or two other birds. The young bird is gently pressed between the feet and against the breast of the parent bird, and sometimes the bill is used to assist in holding the fledgling. Several species of woodcock are native to the Old World. The *common European woodcock* is somewhat larger than the American. The female measures about 13 in. in length and is somewhat larger than the male.

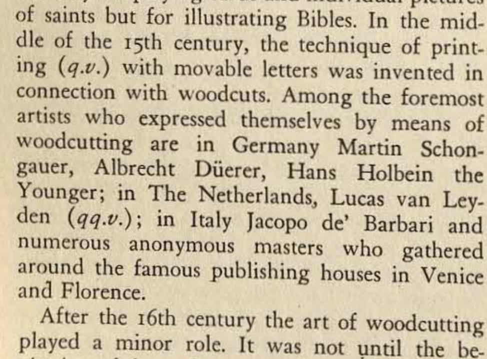
Woodcut (*wo͝od′kŭt*), in graphic art, a design cut into a block of wood, or the print of such a design. This technique was invented early in the 15th century, almost simultaneously in Germany and Italy, for the reproduction of representations of saints and, oddly enough, of playing cards. Even before that, designs formed by wooden stencils had been printed on material like linen. Similar techniques had been used for many hundred years before in the Far East.

The technique of woodcutting consists in carving out of the wooden block those parts which should not print so that the protruding parts are inked and thus reproduce the picture. In other words, the picture is represented by the protruding parts, and the receding parts leave the paper blank. The first woodcuts were used not only for playing cards and individual pictures of saints but for illustrating Bibles. In the middle of the 15th century, the technique of printing (*q.v.*) with movable letters was invented in connection with woodcuts. Among the foremost artists who expressed themselves by means of woodcutting are in Germany Martin Schongauer, Albrecht Düerer, Hans Holbein the Younger; in The Netherlands, Lucas van Leyden (*qq.v.*); in Italy Jacopo de' Barbari and numerous anonymous masters who gathered around the famous publishing houses in Venice and Florence.

After the 16th century the art of woodcutting played a minor role. It was not until the beginning of the 20th century that artists like Aristide Maillol (*q.v.*) in France, Ernest Barlach in Germany, and Frans Maserel in Belgium revived the old art.

WOODCUT, 1492

Depicting a scene from "The Decameron"



Wood Distillation (*wo͝od dĭs-tĭl-ā′shŭn*). See *Charcoal.*

Wood Engraving (*wo͝od ĕn-grāv′ĭng*), a technique in the graphic arts different from wood cutting (*q.v.*), developed late out of the latter art. During the 16th and 17th centuries, people had become accustomed to copper engravings (*q.v.*) besides woodcuts and had learned to appreciate the specific artistic values of these copper engravings as to richness of tonal values, subtlety of lines, etc. These qualities were decisively different from those of wood cutting. However, to produce a copper engraving demanded a complicated technique and much time because of the specific qualities of the metal. Thus artists tried to transfer the same principle from metal to wood. In other words, as on the copper plate, they engraved lines into wood so that the ink would stick in the furrows and these furrows would print. This is a decisive difference between wood engraving and wood cutting. In the latter technique, the protruding parts print, rather than the depressions in the block.

In making wood engravings it is necessary to use a hard and fine-grained wood. The wood is dried thoroughly and cut across the grain, but in large engravings several blocks are joined together. In thickness the block is equal to the length of a printer's type, thus making the engraving fit exactly to the ordinary type used in a printing press. The first step in engraving is for the artist to draw the picture by means of a pencil or brush, which is usually done after a thin coating of white has been applied to the surface, and the block is then turned over to the engraver. The tools employed by an engraver are made of the finest steel, thus making it possible to maintain sharp edges, a condition essential in producing high-class work. Large engravings are usually in several blocks, and after the engraving has been completed they are fastened together and used as a single block.

Developing gradually during the 18th century, in France actual wood engraving was done especially for book illustrations, frames and vignettes. In England, Thomas Bewick (1753-1828) developed this art outstandingly; he is well known for his illustrations. In the 19th century the best-known artists working in this medium were in France, Gustave Doré (1832-83), and in Germany, Adolf von Menzel (1815-1905). It must be emphasized that in contrast to wood cutting, in wood engraving the artists generally did only the design and left the actual process of engraving to skilled artisans.

In the 19th century, before the invention of photography, most scientific works and textbooks were also illustrated by drawings reproduced in the technique of wood engraving. See *Copper Engraving; Etching; Lithography; Woodcut.*

Wood Louse (*wo͝od' lous*), a terrestrial crustacean, popularly known as *slater, pill bug,* or *sow bug.* It rolls itself up into a ball, so that only the plates of the back can be seen. It feeds on decaying vegetable and animal matter. Wood louse is also the name of any of several small wingless insects, found among old papers and books and therefore also called *book louse.*

Woodmen of the World (*wo͝od'mẹn ŏv THē wûrld*), a fraternal benefit society, founded in Omaha, Nebr., in 1890 with the objectives of fraternity, protection, and service. The society has more than 415,000 members in 4,000 Woodmen Camps (men's lodges) and Courts (women's lodges) in 44 states. Its youth program includes more than 650 Boys of Woodcraft and Sportsmen's clubs, more than 296 Girls of Woodcraft Courts, with junior membership of 77,519. The nonprofit organization provides all regular forms of life insurance at cost to its members. In 1960 it had total assets of more than $225,000,000; insurance in force represented more than $636,000,000; and it had paid aggregate benefits in excess of $536,000,000.

Woodpecker (*wo͝od'pĕk-ẽr*), a climbing bird of the family Picidae, which comprises more than 300 species found throughout the world except in Australia, parts of Polynesia, and Madagascar. The woodpecker is named for its habit of pecking holes in trees in search of insects and in order to make a place for its eggs. The body is long and slender, the bill is long and hard, the tongue is pointed and extensile (capable of being extended), and the tail feathers are stiff, serving as an aid in climbing and maintaining a position on a tree trunk.

Most of the woodpeckers are brilliantly colored, with markings of red, white, yellow, or green on the head and wings. Among species native to North America are the *red-headed woodpecker,* which is black with a red head and neck; the *ivory-billed woodpecker,* black with white markings and, in the male, a red crest; the *pileated woodpecker,* similar in coloring to the ivory-billed; the *California woodpecker,* which feeds largely on acorns; and the *flicker,* a brilliantly colored bird with black, red, and yellow markings. Among European species are the *great spotted woodpecker* and the *green woodpecker.* A few species, such as the *sapsuckers,* feed partly on sap; and some feed on insects found on the ground.

Wood Pewee (*wo͝od pē'wē*), a small bird of the tyrant flycatcher family, native to the Atlantic coast of North America, named for its plaintive call. The pewee has a rapid, darting flight, and it catches its insect food on the wing. Its plumage is dark olive-green on the back and yellowish-white below, with a grayish band across the wings. Its eggs, of which four or five are laid, are yellowish in color and spotted at the larger end. The pewee is migratory, flying as far south as the West Indies and Central America.

Woodruff (*wo͝od'rŭf*), a pungent herb (*Asperula odorata*) native to northern Europe, used in making wine and perfumes. It grows to 10 in. in height. The woodruff has whorled leaves and small white flowers. The herb is used in making May wine.

Woodruff, WILFORD, fourth president of the Church of Latter-day Saints (Mormons), born in Avon, Conn., March 1, 1807; died in San Francisco, Calif., Sept. 2, 1898. He was ordained a teacher in 1833 and in 1839 became one of the Twelve Apostles of the church. He accompanied Brigham Young (*q.v.*) to the West and in 1847 was one of the first Mormons to enter the Great Salt Lake valley. He served as president of the Twelve Apostles from 1880 to 1889, in the latter year succeeding to the presidency of the church. For 22 years he was a member of the Utah legislative assembly. An early defender of the institution of polygamy, Woodruff announced in 1890 the church's official prohibition of the practice.

Woods Hole (*wo͝odz hōl*), a village in Massachusetts, in the town of Falmouth, at the southwestern point of Cape Cod. It is notable as the site of the Woods Hole Oceanographic Institution, a world center of marine sciences founded in 1930; the Marine Biological Laboratory, an independent organization owned by *ca.* 350 biologists; the U.S. Navy Laboratory of Oceanography; and a laboratory of the U.S. Fish and Wildlife Service. The Oceanographic Institution operates a shore plant and a fleet of ocean-going research vessels. Population, 1950, 549.

Woods, LAKE OF THE, a lake on the U.S.-Canadian border, 65 m. long and 10 m. to 60 m. wide. It borders Roseau and Lake of the Woods counties, Minnesota, and the Canadian provinces of Manitoba and Ontario. Its area is 1,851 sq. m., of which 466 sq. m. are in U.S. territory. The northernmost point of the mid-continental U.S. lies on the north shore. Rainy River flows into the lake, which itself drains into Lake Winnipeg.

Woodstock (*wo͝od'stŏk*), a village in Ulster County, New York, 12 m. N.W. of Kingston. Located in the foothills of the Catskill Mts., it has no direct rail communications and is reached only by car or bus. Woodstock is noted as the site of an artists' colony, started late in the 19th century. It has many art schools, including one maintained by the Art Students' League of New York City. It maintains a summer-theater stock company and has summer and winter sport facilities. Population, 1940, 1,067; in 1950, 2,271.

Woodward (*wo͝od'wẽrd*), CALVIN MILTON, educator, born in Fitchburg, Mass., Aug. 25, 1837;

Courtesy 1 Australian News & Information Bureau, N. Y.; 2-14 Forstmann Woolen Co., Passaic, N. J.

FROM SHEEP TO WOOLEN FABRIC

1 Shearing the sheep. The Merino ram waiting his turn will yield about 28 pounds of wool, or 2,500 miles of thread. *2* Sorting the wool. Fibers from different parts of the animal vary greatly and must be grouped before processing. *3* Picking and fluffing. Fat, grease and other foreign substances are removed in this primary cleansing operation. *4* Scouring the wool. The remaining impurities are washed out as the wool is passed through successive troughs of water. *5* Ready for manufacture. This wool has been scoured, carded, sorted for type and size and cleansed of natural impurities. *6* Wool carding. The fine-toothed rollers cross the stretched fibers, forming them into a veil-like mesh. *7* Intersecting mixer. The longer fibers, called *tops*, are mixed together to level the combined tops

died Jan. 12, 1914. He was graduated from Harvard Univ. in 1860 and immediately became principal of the Brown high school, Newburyport, Mass., serving until 1865. In the latter year he was elected to the professorship of mathematics and applied mechanics at Washington Univ., St. Louis, and in 1870 became dean of the school of engineering. He was one of the organizers of the St. Louis Manual Training School and for some years served as regent of the Missouri State Univ., of which he became president in 1904. He published: "Manual Training and Education," "History of the St. Louis Bridge," and "The Manual Training School."

Woodward, ROBERT SIMPSON, educator, born in Rochester, Mich., July 21, 1849; died June 29, 1924. He studied at the Univ. of Michigan and became an engineer on the lake survey of the U.S. He was assistant astronomer from 1882-84, serving at the station in San Antonio, Tex., and later was astronomer to the U.S. geological survey. He was made professor of mechanics at Columbia Univ. in 1893, was later chosen professor of mathematical physics, and in 1895 became dean of the faculty of pure science. In 1905 he was elected president of the Carnegie Institute, Washington, D.C. Among his publications are many memoirs and papers on mathematics and the sciences.

Wool (*wo͝ol*) is a multicellular fiber in structure and consists largely of two fundamental layers, the epidermis (or scale) and the cortex. Some fibers have a rudimentary third layer, the medulla. The epidermis, or top layer, viewed under a microscope, is revealed as being composed of serrations or scales which overlap, not unlike the shingles of a roof. Wool's felting and shrinking properties are in a large measure related to the number and fineness of these scales on the fiber surface. Wool fibers are round to oval and of various lengths.

Wool is the fiber from the fleece of the sheep. Under U.S. law, the fiber of hair from the Angora and Cashmere goat and the so-called specialty fibers such as the hair of the camel, alpaca, llama, and vicuna are also included in the general term wool. Further, under U.S. law, wool fibers reclaimed from unused woven or felted wool products must be designated "reprocessed" wool and wool fibers reclaimed from spun, woven, knitted or felted wool or "reprocessed" products which have been used must be designated "reused" wool. None of these terms has any direct bearing on the measurable quality of the fiber; they indicate only the fiber history.

Wool production of the world is estimated at 3,760,000,000 to 4,000,000,000 greasy pounds—that is, wool with the natural oil, suint, dust, burs, and other foreign matters still in the fleece. At present, the U.S. ranks third as a wool producer with about 390,000,000 pounds, and Australia first, by far, with 900,000,000 pounds, and Argentina second with 500,000,000 pounds.

The coarser wool fibers are known as carpet

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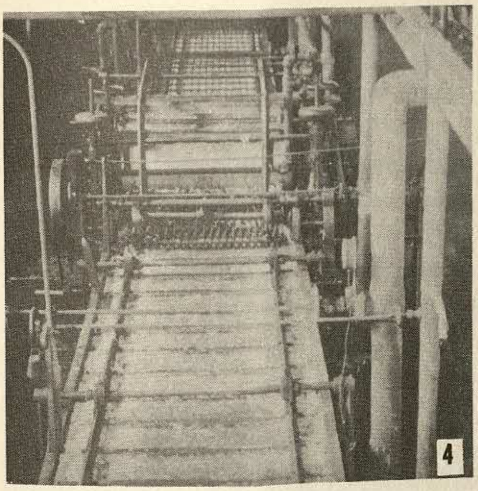

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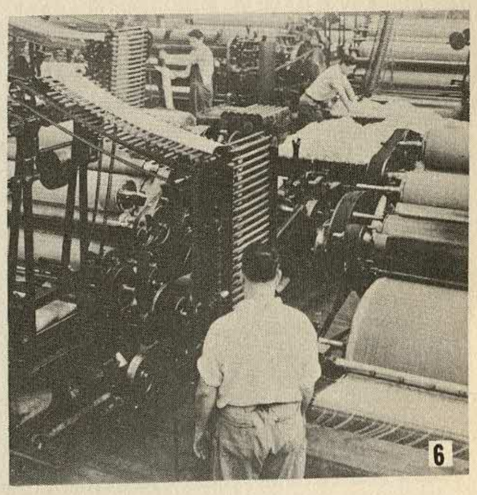

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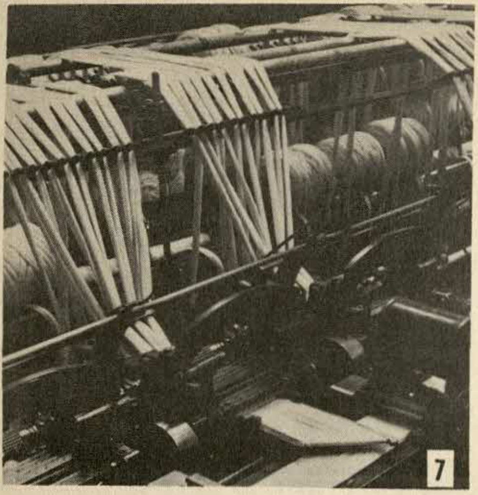
wools and the softer, finer fibers as apparel wools. The coarser wools come in large measure from the sheep of China, Asiatic Russia, and India, where there has been little effort to improve the breed of sheep. Australia and the U.S. produce practically no carpet wools, and only about 30 per cent of Argentine wools are of that class.

Climatic conditions govern the shearing of sheep and although somewhere wool is being sheared every month of the year the bulk is shorn in the spring. In a few areas wool is shorn twice a year.

There are many different breeds of sheep and endless grades and qualities of wool, so that its manufacture into usable products is a constant process of refining and organization.

First, the fleeces are graded for quality, length of staple, and general condition. When lots of light fleeces have been assembled the individual fleeces are then sorted, for each fleece contains many grades of wool. Usually, the wool finest in diameter and of best quality is found on the shoulders and sides. Sorting wool fibers into grades of similar lengths is done in the mills by expert sorters who can tell almost intuitively by touch and sight into which grade the fibers fall. It is at this point that the fleece loses all identity and the selection of the proper type of fiber for the specific product to be made is exercised. Wools are then scoured to remove the suint, grease, oil, dust, dirt, vegetable bur, and other foreign matter in a long chain of scouring bowls through which the wool is dragged by moving tracks. In this scouring process the loss of weight ranges from 40 to 60 per cent.

The wool is then opened—an operation which disentangles and separates the matted mass of fibers as it comes from the scouring and drying process—and carded to remove what foreign vegetable matter remains and to align the fibers. The carding machine is a series of large and small cylinders, covered with wire, which operate on the fibers much as a hairbrush operates on hair. The woolen card delivers numerous small strands of wool containing mock twist. These strands are wound on spools and go directly to the mule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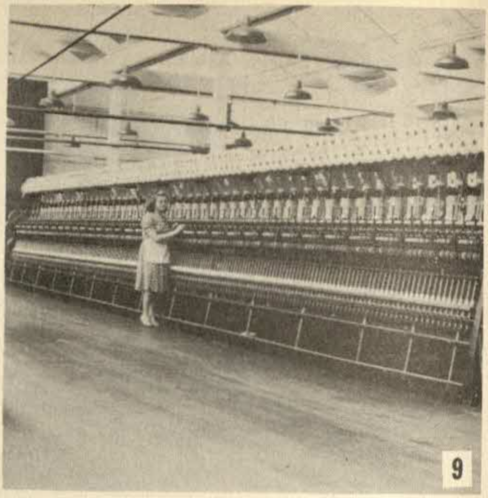
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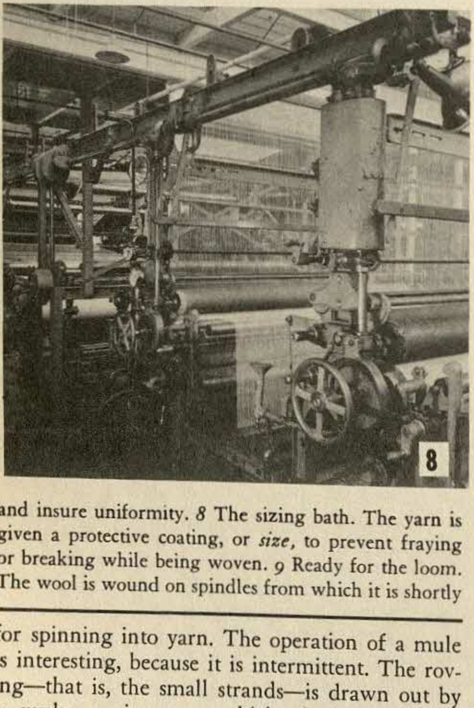
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and insure uniformity. *8* The sizing bath. The yarn is given a protective coating, or *size,* to prevent fraying or breaking while being woven. *9* Ready for the loom. The wool is wound on spindles from which it is shortly to be woven into cloth. *10* The weaving room. Interior of one of the larger mills where the many looms will transform the yarn into cloth.

11 Carbonizing. This treatment eliminates whatever

for spinning into yarn. The operation of a mule is interesting, because it is intermittent. The roving—that is, the small strands—is drawn out by a mule carriage on which the spindles are mounted. The carriage travels faster than the rate of delivery of the strand, thus reducing the thickness of the strand. When the carriage reaches its farthest extension it stops but the spindles continue to whirl, imparting twist to the yarn. Then the carriage returns to the stationary section of the machine while winding the yarn just spun on the bobbins.

The worsted card does not deliver the multiple small strands but rather the wool is lifted from the final cylinder in the form of a web which is condensed to a thick single strand by passing through a funnel. Gilling reduces and draws out several of these strands or card slivers and equalizes the differences in fiber distribution, meanwhile paralleling the fibers. These slivers then pass to the worsted comb where the short fibers are separated from the longer fibers, the latter comprising a product known as "top" which is, in fact, the raw material for worsted yarn spinning. The shorter fibers are separately delivered by the comb and are called noils.

These noils are used alone or combined with other wool fibers in the manufacture of woolen yarns. The worsted top produced by the comb is further evened by repeated doubling and drawing operations. Multiple ends are combined and drawn out to make one of lesser thickness with the fibers further straightened and paralleled each time. When these slivers have been produced to

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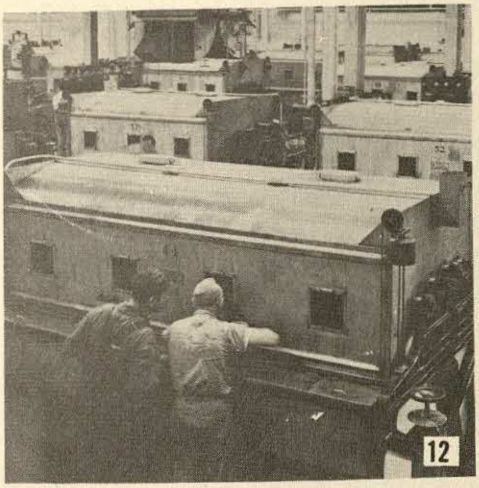
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trace of foreign substance may have remained in the fiber. *12* Piece dyeing. The temperature of these stainless steel vats is automatically controlled and the wool constantly watched. *13* Teazling. Passing the cloth over a frame of vegetable burrs, called *teazles*, softens and raises the nap. *14* Final Examination. High-quality wools are usually subjected to the careful scrutiny of experts before leaving the mill

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the proper diameter they are ready for spinning.

In both woolen and worsted spinning, the yarn may be spun on the mule or on a spinning frame. The spinning frame differs from the mule in that the action is continuous. Spindles revolve on stationary frames and roving is fed continuously from the set rollers through an eyelet placed over an upright spindle which whirls the strand into yarn and at the same time winds it upon a bobbin. The yarns then may be transferred into cloth by weaving or knitting (*qq.v.*).

Wool, JOHN ELLIS, soldier, born at Newburgh, N.Y., Feb. 20, 1784; died Nov. 10, 1869. He studied law and engaged in the book business in Troy, but entered the army in 1812. For gallant services at Queenston Heights he was promoted to the rank of major. In 1816 he was made a colonel, which position he retained until 1841, when he was appointed brigadier general. During the Mexican War he fought under Gen. Taylor, whom he succeeded in command of the army, when the latter returned to the U.S. At the beginning of the Civil War he was placed in command at Fortress Monroe and in 1862 he occupied Norfolk and Portsmouth. He continued in active service until 1863, when he was retired with the rank of major general.

Woolf (*wŏŏlf*), VIRGINIA STEPHEN, writer, born in England in 1882; died in 1941. An experimentalist in fiction writing, she became an exponent of the technique known as "stream-of-consciousness," used in her chief works, including: "The Voyage Out" (1915), "Jacob's Room"

Photo by Man Ray, courtesy Harper's Bazaar

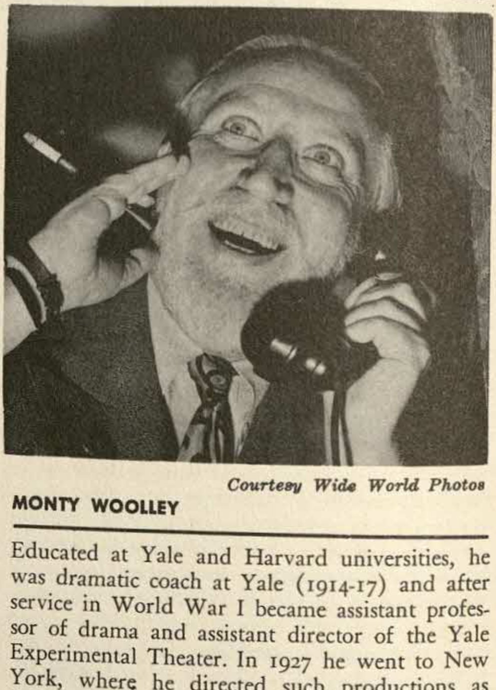
VIRGINIA WOOLF

(1922), "Mrs. Dalloway" (1925), "To the Lighthouse" (1927), "Orlando" (1928), "The Waves' (1931), "Between the Acts" (1941), and others. Her critical works, her treatise on women's independence "A Room of One's Own" (1930), and her delightful biography of Elizabeth Barrett Browning's cocker spaniel "Flush" (1933) also added to her distinction as a writer. With her husband, *Leonard Woolf* (1880-), she founded the Hogarth Press.

Woollcott (*wŏŏl′kŭt*), ALEXANDER, journalist and writer, born at Phalanx, N.J., Jan. 19, 1887; died Jan. 23, 1943. Writing for the New York *Times* whose staff he joined in 1909, he had become drama critic when he was called to the armed forces in World War I. Returning to New York he continued to write drama and literary reviews for the *Times* (1914-22), the New York *Herald* (1922), and the New York *World* (1925-28). In this capacity, and as "Town Crier" in his popular radio broadcasts (1929-43), he endeared himself to his reading and listening public by his literary standards, his terse, caustic comments, and his unique personality. He also appeared on the stage, notably in "The Man Who Came to Dinner" (1940) in which he played a character strikingly like himself. Author of "Mr. Dickens Goes to the Play" (1923), "The Story of Irving Berlin" (1925), "While Rome Burns" (1934), and several other books, he also contributed to magazines, and edited the anthologies, "The Woollcott Reader" (1935), "Woollcott's Second Reader" (1937), and "As You Were" (1943).

ALEXANDER WOOLLCOTT

Photo by R. C. Wood, courtesy Viking Press, N. Y.



Courtesy Wide World Photos

MONTY WOOLLEY

Woolley (*wŏŏl′ĭ*), EDGAR MONTILLION (MONTY), actor and director, born in New York, N.Y., Aug. 17, 1888; died in Albany, May 6, 1963. Educated at Yale and Harvard universities, he was dramatic coach at Yale (1914-17) and after service in World War I became assistant professor of drama and assistant director of the Yale Experimental Theater. In 1927 he went to New York, where he directed such productions as "Fifty Million Frenchmen" (1929), "The New Yorkers" (1930), and "Jubilee" (1935). In 1937 he went to Hollywood to act in motion pictures, returning to Broadway to play the leading role in "The Man Who Came to Dinner" (1939), a role he recreated in the film version (1941). Other motion pictures included "The Pied Piper" (1942), "Holy Matrimony" (1943), "Since You Went Away" (1944), "Night and Day" (1946, a biography of Cole Porter, in which Woolley played himself), and "As Young As You Feel" (1951).

Woolley, MARY EMMA, educator, born in South Norwalk, Conn., July 13, 1863; died in Westport, N.Y., Sept. 5, 1947. She studied at Brown Univ. and was, in 1894, the first woman to receive an A.B. degree there. She taught at Wheaton Seminary (1886-91) and Wellesley Coll. (1895-1900), heading the Wellesley department of Biblical history and literature in 1900. As president of Mt. Holyoke Coll. (1900-37), she greatly influenced women's education in the U.S. She was also active in public affairs (*e.g.*, as a member of the U.S. delegation to the Geneva disarmament conference, 1932-33) and took part in the work of many organizations. She published historical monographs and numerous articles on education.

Woolman (*wo͝ol′mạn*), JOHN, Quaker preacher, born in Northampton, N.J., in August 1720; died in York, England, Oct. 7, 1772. He started as a tailor, but in 1743 he joined the Quaker ministry and became an itinerant preacher, traveling through the colonies and England, chiefly preaching against the evils of slavery. Although he apparently achieved little practical success, he actually had great influence on thinking men both in England and America and did persuade many Quakers to free their slaves. He wrote: "Some Considerations on the Keeping of Negroes" (1754), "Considerations on Pure Wisdom and Human Policy, on Labor, on Schools, and on the Right Use of the Lord's Outward Gifts" (1768), "Considerations on the True Harmony of Mankind, and How It Is to Be Maintained" (1770), "A Word of Remembrance and Caution to the Rich" (1793), and "The Journal of John Woolman's Life and Travels in the Service of the Gospel" (1775).

Woolsey (*wo͝ol′sĭ*), THEODORE DWIGHT, educator and author, born in New York City, Oct. 41, 1801; died in New Haven, Conn., July 1, 1889. He was graduated from Yale in 1820, studied law in Philadelphia and theology at Princeton. After serving as tutor at Yale for two years, he studied for three years in the German Univs. of Bonn, Leipzig, and Berlin. In 1831 he became professor of Greek in Yale Univ., where he remained for 15 years, and in 1846 was chosen president of that institution. He held that office for 26 years and in the meantime greatly improved its courses and enlarged the influence of the university. From 1871-81 he was president of the American committee that aided in revising the New Testament. He was a founder of the *New Englander* and published works entitled: "Political Science," "Study of International Law," "Communism and Socialism in Their History and Theory," and "Helpful Thoughts for Young Men." He also wrote many articles for the *North American Review*, the *Princeton Review*, and the *Century*.

Woolwich (*wo͝ol′ĭj*), a borough of London, England, formerly a town in Kent County about 10 m. S.E. of the city of London. It extends along the Thames River for about 3 m., with docking and railroad facilities. In Tudor days the dockyards of the Royal Navy were established there, and it was famous for shipbuilding and repairing. The dockyards were closed in 1869. Its present importance lies in the enormous arsenal covering hundreds of acres and including barracks, gun factories, and ordnance departments. Its military character is increased by the Royal Military Acad. (present building started 1806), the training center for cadets in the royal artillery, engineers, and signals. North of the Thames lies the industrial section of the borough. Population, *ca.* 150,000.

Woonsocket (*wo͞on-sŏk′ĕt*), a city in Providence County, Rhode Island, on the Blackstone River, 40 m. s.w. of Boston, Mass. It is on the New York, New Haven & Hartford R.R. and is served by several bus lines. Among its points of interest are the city hall building (1856), the John Arnold House (1712), and the Vose House. It is one of the greatest textile centers of America. Its manufactures include chemicals, soaps, curtains, brushes, raincoats, bathing suits, rubber goods, hardware, musical instruments, machinery, and farm implements. Near the city is Woonsocket Hill, an elevation 580 ft. above sea level, which is the highest point in the state. Woonsocket was incorporated as a city in 1888. Population, 1950, 50,211.

Wooster (*wo͝os′tẽr*), a city in Ohio, seat of Wayne County, situated 57 m. S.E. of Cleveland. It is served by the Pennsylvania and the Baltimore & Ohio R.R.'s. It is in an important crop-growing, livestock- and poultry-raising country, with dairying interests. Bee cultivation and the raising of sheep for wool are also important occupations. The manufactures include dies and molds, truck bodies, steel products, roller bearings, rubber goods, toys, building material, and dyes, paints, and varnishes. The city is the seat of the Coll. of Wooster (opened, 1870) and of the Wooster Public Museum. The Ohio Agricultural Experiment Station is nearby. The city was settled in 1807 and named for David Wooster (1711-77), a Revolutionary War general who was fatally wounded in the battle of Ridgefield, Conn. It was incorporated in 1868. Population, 1940, 11,543; in 1950, 14,005.

Worcester (*wo͝os′tẽr*), the second-largest city in Massachusetts, a county seat (with Fitchburg) of Worcester County, situated on the Blackstone River, *ca.* 40 m. w. of Boston. It is served by the New York Central, the Boston and Maine, and the New York, New Haven & Hartford R.R.'s. The municipal airport is 3.9 m. w. of the center of the city.

Worcester has an area of 38.4 sq. m. and lies 481 ft. above sea level in the heart of New

England. Among its principal buildings are the State Mutual Life Assurance building and the American Antiquarian Society. Nearby points of interest are the resorts of Lake Quinsigamond and Mt. Wachusett, and Sturbridge Village, a reconstruction of an early New England village with authentic houses and shops in actual operation.

The city is an industrial and marketing center. Its manufactures include machinery, primary metals, wire, textiles and textile machinery, grinding wheels, paper products, and stone, glass, and clay products. Worcester is the center of a standard metropolitan statistical area (pop., 1960, 323,306) which includes the city and 19 towns in Worcester County. The city had a value added by manufacture of $285,417,000 in 1958.

Worcester's nearly 100 public and parochial schools enroll *ca.* 38,000 pupils annually. The institutions of higher learning include Clark Univ., Assumption Coll., Holy Cross Coll., Worcester Polytechnic Inst., Worcester State Teachers Coll., and two junior colleges. Other cultural institutions include the Worcester Art Museum and the auditorium, where the annual Worcester Music Festival is held in October.

The first white settlement, Quinsigamond Plantation, was established in 1673 on the lake shore. Two years later, however, the settlers fled at the outbreak of King Philip's War. Another attempt at settlement, in 1684, failed because of Indian uprisings. The permanent settlement began in 1713 when Jonas Rice, one of the 1684 settlers, returned with his family.

The Boston & Worcester R.R. was the first railroad to enter the town, in 1835. The city was incorporated in 1848. Under a charter adopted in 1947, it is governed by a city manager and a nine-member council elected for two-year terms.

Worcester's population in 1720 was *ca.* 250. Its greatest increases were in the 1890-1900 decade—from 84,665 to 118,421—and in the 1910-20 period—145,986 to 179,754. In 1950 the population was 203,486; in 1960, 186,587.

Worcester, a city in England, capital of Worcestershire, 120 m. N.W. of London, on the River Severn and served by two railroad lines. Its manufactures include porcelain, gloves, and a sauce named for the county. Its history goes back perhaps to Roman times but definitely to the 7th century, when a bishopric was founded here. The cathedral—with an 11th-century crypt—was begun in the early 13th century. The city was a Royalist stronghold; Prince Rupert won a victory here at Powick Bridge in 1642, but Cromwell's forces defeated those of Charles II in 1651. *Berrow's Worcester Journal,* said to have been founded in 1690, claims to be the oldest British newspaper still extant. Population, 1951, 59,700.

Courtesy New York Central System

THE COMMONS OF WORCESTER, MASS.

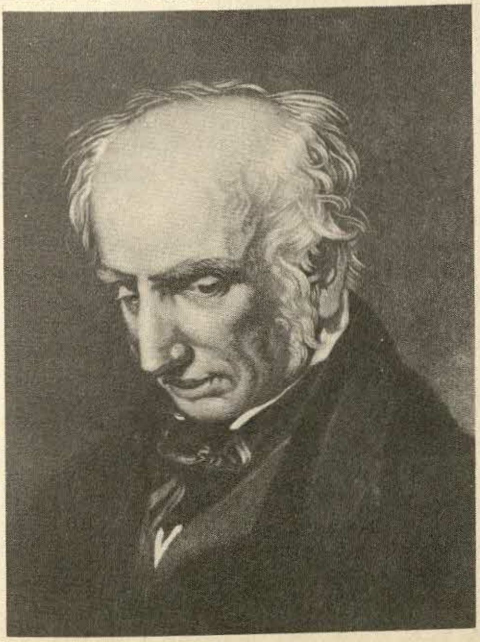
Worcester, JOSEPH EMERSON, lexicographer, born in Bedford, N.H., Aug. 24, 1784; died in Cambridge, Mass., Oct. 27, 1865. He was graduated from Yale Univ. in 1811 and, after a short career as a school teacher, settled in Cambridge in 1819 to begin his literary work. A compiler of dictionaries, he published a "Comprehensive Pronouncing and Explanatory Dictionary of the English Language" (1830) and several other similar works. At one time, Noah Webster accused him of plagiarism.

Worcestershire (*wŏŏs′tẽr-shĭr*), a county in the Midlands of England, with an area of 699 sq. m. It has a beautiful country site and offers much to the tourist. The River Severn traverses the county in a north-south direction, and the Avon and Stour rivers also flow through it. The Malvern Hills, on its southwestern border, and the valley of the Avon contribute to the county's scenery. It is primarily a fruit-growing region, but the northern section is industrialized. The manufactures include ironwork, chemicals, glass, automobiles, porcelain, furniture, clothing, and paper. Certain Roman remains are in evidence. The monastic movement was important in the county's history, and there are notable examples of monastic architecture. The village of Broadway is well known for its Elizabethan structures, and Great Malvern is renowned for its theater festival in August. Evesham is remembered for the battle of 1265, in which Prince Edward (Edward I) defeated Simon de Montfort. Worcester (*q.v.*) is the capital. Population, 1951, 522,846.

Worden (*wôr′dẹn*), JOHN LORIMER, naval officer, born in Westchester County, New York, Mar. 12, 1818; died in 1897. He joined the navy as midshipman in 1834, was commissioned a lieutenant in 1846, and commanded the *Monitor* (*q.v.*) in the fight against the *Merrimac* at Hampton Roads in 1862. During the engagement his sight was injured by a shell, but he was on duty at New York and in the Pacific squadron until after the war, when he was promoted to the rank of commodore. In 1870 he was made superintendent of the Naval Acad. at Annapolis, Md., and two years later was commissioned rear admiral. He commanded the European squadron (1875-77) and retired at his own request in 1886.

Wordsworth (*wûrdz′wûrth*), WILLIAM, poet, born at Cockermouth, England, Apr. 7, 1770; died Apr. 23, 1850. He was poet laureate of England from 1843 until his death.

After his graduation from Cambridge, where he did not distinguish himself, Wordsworth spent the period from November 1791 until December 1792 in France, where he became a zealous sympathizer with the aims of the French Revolution. Although he lost his enthusiasm for the revolution during the later reign of terror, Wordsworth remained sympathetic with republican and "reform" principles throughout most of his life. His interest in and sympathy for the "common man" are characteristic of the greater part of his work. He lived most of his life somewhat isolated from the rest of mankind, however, and found his greatest satisfaction in communion with nature.



WILLIAM WORDSWORTH

In 1795 Wordsworth received a small legacy from a friend and thereupon settled, with his sister Dorothy, at Racedown, in Dorsetshire. Here he was visited by Coleridge, and the two men began what became one of the most famous and one of the most fruitful friendships in English literary history. In 1797 Wordsworth moved to Alfoxden, in Somerset, in order to be near Coleridge. Finally the two friends settled, with Southey, near Grasmere, in the Lake Region of England, and the three poets came to be known as "the Lake Poets."

In 1798 Wordsworth and Coleridge published a joint volume, "Lyrical Ballads," destined to become an important landmark in English literature. Coleridge's contribution was restricted to a single poem, but that poem is by far his most widely known work—"The Ancient Mariner." Wordsworth's contributions to the volume include, among many other poems, "We Are Seven," "The Idiot Boy," "Simon Lee," and "Tintern Abbey." Wordsworth's preface to the second edition of "Lyrical Ballads" (1800) is an extremely important critical essay, serving almost as a manifesto for the school of romantic poetry. Its importance is enhanced by the commentary upon it that Coleridge later included in his "Biographia Literaria."

Almost all of Wordsworth's early poetry, including the "Lyrical Ballads," was violently attacked by conventional critics. His reputation as the leading poet of his day developed slowly. General recognition did not come to him before 1820, but his fame then grew steadily and, by 1840, he was universally recognized as the greatest living English poet. When he was named poet laureate in 1843, upon the death of his friend Southey, he was able to stipulate that he should be required to write no official poems.

Wordsworth was a prolific writer but not a consistent one. He projected many works that he never finished, and among his finished work there is a great range of merit. He wrote many inferior poems; but the quantity and quality of his best work is so great that he is usually regarded as fourth among English poets, with only Chaucer, Shakespeare, and Milton ranking above him.

Wordsworth's most important works, in addition to the "Lyrical Ballads," include "The Prelude" and "The Excursion" (long autobiographical poems), his many sonnets (which include some of the best sonnets in English), and such varied poems as the "Ode to Duty," "Ode on Intimations of Immortality," the "Lucy" poems, and "Michael."

Workhouse (*wûrk′hous*), the name used in England for an establishment maintained for paupers, in which minor offenders are also detained for a short time. The term applies in England to houses of correction maintained by the authorities to segregate paupers from others, where they are required to work as a means of reform or as a punishment for some minor offense. In the U.S. the name is sometimes applied to places where vagrants and drunkards are confined at work, but such establishments are more generally spoken of as *houses of correction*. In the U.S., *county jail* or *poorhouse* correspond more nearly to the English workhouse. Workhouses were intended to suppress vagrancy in England, especially under a general act of Parliament passed in 1782. In theory, such establishments offered secular and religious instruction and enforced habits of cleanliness and industry. Those confined to the workhouse were usually unable to pay a nominal fine, and the expense of keeping them was at least partly compensated for by the labor they were required to do in confinement.

Workmen's Compensation (*wûrķ′męnz ķŏm-pĕn-sā′shŭn*), a form of social insurance providing monetary compensation for injuries arising in the course of employment. In recent years; workmen's compensation has been extended also to occupational diseases (*q.v.*), but the coverage of these diseases is far from complete.

In the early days of industrialism, the rule was that an injured worker was not entitled to collect damages from his employer for his injury unless he could prove that the employer had himself been negligent and that the employer's negligence had caused the injury. Even if such negligence could be proved, the worker could still not collect if he had himself been partly responsible for the accident, if the accident had been caused by the negligence of a fellow worker, or if the injury was caused by a normal risk involved in the industry. In any event, unless the employer were willing to settle out of court, protracted litigation was required before damages could be collected.

This early, or "common law" phase was followed by employers' liability legislation which modified to some extent the harshness of the common-law rule by providing, for example, that negligence of a fellow worker could not be used to absolve the employer from liability. However, the principle that the employer was not responsible unless he had been at fault, and therefore the necessity for litigation, remained.

The basic change effected by workmen's compensation, which is almost entirely a 20th-century growth, was that it eliminated the principle of "no liability without fault" and substituted the principle that all accidents were to be compensated regardless of whose fault caused them. Moreover, it substituted awards by administrative bodies such as Workmen's Compensation Commissions for the elaborate judicial process which had previously been necessary.

Germany introduced a compulsory accident insurance law in 1884. In 1897, Great Britain enacted the British Workmen's Compensation Act. In the U.S., Maryland experimented with workmen's compensation as early as 1902. A short-lived workmen's compensation law applying to miners was enacted by Montana in 1909. The first compulsory workmen's compensation law, passed by New York in 1910, was declared unconstitutional by the Court of Appeals. Despite the amendment of the state constitution which validated compulsory compensation laws, many states preferred not to follow New York's lead. Instead of compulsory laws, they enacted "elective" laws, under which the employer or the worker or both were permitted to choose coverage under compensation laws. Failure to elect to be covered brought so many obstacles in damage suits that the "elective" laws in practice proved compulsory.

In the U.S. at the present time, all states, the Territories of Alaska, Hawaii, Puerto Rico, the Virgin Islands, and the Federal Government have enacted workmen's compensation laws. The U.S. Bureau of Employees' Compensation of the U.S. Dept. of Labor administers the act of Sept. 7, 1916, which provides workmen's compensation benefits for civil employees of the U.S. suffering injuries in line of duty. However, certain large groups of workers such as railroad employees and seamen are not covered by compensation laws, largely because the workers feel that employers' liability laws give them greater protection. Also not covered by compensation laws in general are farm laborers, domestic servants, and employees of non-profit institutions.

Workmen's compensation laws in the U.S. are characterized by the following provisions: (1) *Waiting time before compensation becomes payable,* prescribed in all states but Oregon and ranging from less than one week to 10 days; (2) *temporary disability,* the compensation ranging from 80 per cent of the worker's wage to 50 per cent. Thirty-seven states set a maximum time-limit during which payments are allowed, ranging from 156 to 1,000 weeks; (3) *permanent total disability,* for which the worker is to receive a fractional wage every week, limited to 22 states and the Federal Government. Other states limit compensation to between 260 and 1,000 weeks; total maximum compensation, where limited, ranges from $3,000 to $15,750; (4) *permanent partial disability,* for which special payments are made, scaled according to the member or faculty lost. Payment for extra disability (*e.g.,* the loss of a second eye) out of special funds is provided by 41 states, Alaska, Puerto Rico, the District of Columbia, Hawaii, and the Federal Longshoremen's Act; (5) *medical care,* and surgical appliances which may be necessary for injured workers are provided for in compensation laws, though practice in this matter varies considerably from state to state; (6) *death,* for which 47 states pay funeral expenses in addition to compensation. In most of the states, the widow gets 40 per cent or more of the weekly wages until death or remarriage, plus an allowance for each child under a certain age; (7) *rehabilitation,* first provided (1918) by Massachusetts through surgery, re-education, and other means, and copied in the next year by nine other states. In 1920, Congress agreed to match with equal sums all amounts appropriated by the states for rehabilitation. At present, all states are cooperating in this program; (8) *occupational diseases,* fully covered under the laws of 24 states, and covered for certain diseases in 17 states.

Most states recognize insurance of the employer's liability to pay compensation as an essential feature of their workmen's compensation statutes, and 22 of the states make it compulsory. Eighteen of the states have state fund insurance systems; in seven of these, the state funds are monopolistic, and no private insurance firms may underwrite employers.

Most states have established official agencies for the technical administration of workmen's compensation laws. The administrative officials of these state agencies and those of the Canadian provinces are organized into the International Assn. of Industrial Accident Boards and Commissions for the purpose of studying and discussing common problems. See also *Employer's Liability; Insurance; Rehabilitation.*

Works Progress Administration (WPA) (*wûrk̤s prŏg'res ăd-mĭn-ĭs-trā'shŭn*). Established by Executive Order of May 6, 1935, under the authority of the Emergency Relief Appropriation Act and continued by subsequent yearly acts, the WPA program of useful public works lessened the unemployment and relief problems of the depression. On July 1, 1939, its name was changed to *Work̤ Projects Administration,* consolidating it into the Federal Works Agency until its liquidation in December 1942.

During the years of its operation the WPA employed at one time or another some 8,500,000 Americans on its diversified projects. In addition to building and improvement work, the WPA provided educational, professional, and health services, conducted nurseries, ran lunch programs, and distributed clothing and supplies to the needy. These services, some of which were absorbed for continuation by other Federal welfare services, benefited not only those who were thus employed but also the millions who were receivers of the work, *e.g.,* students who attended free WPA classes.

Expenditures on all WPA projects from its inception in 1935 through its conclusion in 1942 totaled $10,072,327,631.

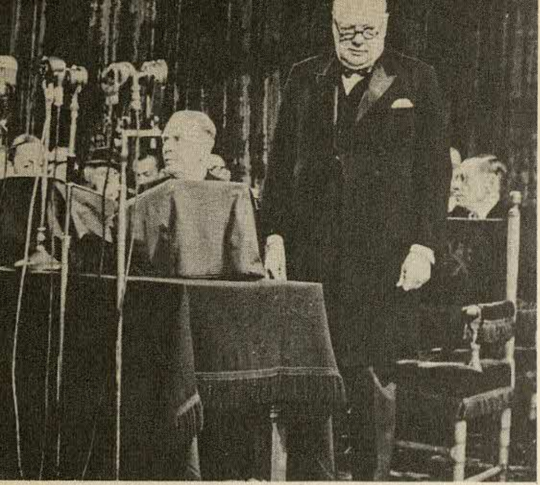
World's Columbian Exposition (*wûrldz k̤ō-lŭm'bĭ-ạn ĕk̤s-pō-zĭsh'ŭn*). See *Exposition.*

World Council of Churches (*wûrld k̤oun'sĭl of chûr'chẹz*), a voluntary association of non-Catholic Christian churches, now comprising 154 communions and 21 major groupings of churches, and representing approximately 150,000,000 Christian persons in more than 40 nations. The council was officially inaugurated at the World Assembly of Churches held in Amsterdam, Holland, from Aug 22 to Sept. 4, 1948. Under the constitution adopted there, the council functions administratively under a Committee of Ninety (the central committee), headed by six presidents representative of six major church trends in the council, *i.e.,* Anglican, Calvinist, Orthodox, Lutheran, Methodist, and so-called "Younger" churches. The aim of the council is to provide an organ for interchurch action on a world-wide basis. U.S. offices of the council are in New York City and in Chicago, Ill. The international headquarters is in Geneva, Switzerland.

World Court (*wûrld k̤ôrt*). See *Arbitration; International Court of Justice; League of Nations; United Nations.*

World Federation of Trade Unions (WFTU) (*wûrld fĕd-ẽr-ā'shŭn of trād ūn'yŭnz*), an international body composed (at the time of its founding) of 63 trade-union organizations representing an estimated 66,000,000 organized workers in 56 countries. The constitution of the WFTU was unanimously adopted on Oct. 3, 1945, by delegates to the World Trade Union Conference in Paris after a series of preliminary efforts which had begun in 1941. At the Paris conference the delegates elected a general council and executive committee consisting of 26 members including the general secretary of the WFTU. Louis Saillant of France was appointed the first general secretary and Sir Walter Citrine was designated the first chairman of the executive committee. The chairman and six vice chairmen of the executive committee together with the general secretary constitute the executive bureau. Among the nations which have been represented are the U.S.S.R., Great Britain, France, and the U.S. The Congress of Industrial Organizations (C.I.O.) was the chief U.S. representative, the A.F. of L. having refused to join.

The World Federation of Trade Unions was created as a means of unifying organized workers throughout the world. According to its constitution, the organization seeks to establish the "freedom of the working people everywhere to organize themselves in trade unions and to exercise freely the right of collective bargaining and all other normal trade-union activities." Following World War II it sought to advance this aim by obtaining representation on international com-



Courtesy British Combine

CHURCHILL AT THE CONGRESS OF EUROPE

Held at The Hague, Holland, in May 1948, the first modern Congress of Europe was opened by Winston Churchill, World War II Prime Minister of Great Britain, who demanded the establishment of a European assembly as a prelude to world government

missions and agencies concerned with settling and maintaining world peace.

In January 1949 a major split in WFTU ranks occurred when the C.I.O., the British Trades Union Congress, and the Dutch Trade Union Federation, representing the non-Communist minority on the WFTU's executive bureau, withdrew from the organization, characterizing it as a "Communist monopoly." This split reduced WFTU membership by an estimated 25,000,000.

World Government (*wûrld gŭv′ẽrn-mẹnt*), a proposed form of government with power to make, interpret, and enforce world law which would be applicable not only to member nations but also to individual citizens, in order that international disputes might be settled by law rather than by force. Federal in form, this government would be given only those powers necessary to insure peace, while all other powers would be reserved to the nation-states. Proponents hold that membership in such a world government must eventually be universal to insure protection from war. Movements aimed at establishing such a government have sprung up intermittently throughout modern history.

Organizations such as the League of Nations and the United Nations (*qq.v.*), set up as leagues of sovereign states bound by treaties signed by national governments, have been unable to enforce decisions because of the organizations' inability to compel a member nation to accept a majority decision. In the case of the U.N., the veto power makes it possible for any one of the "Big Powers" to block a majority decision.

Advocates of world government maintain that to correct this basic flaw, each country would have to delegate to the U.N. a portion of its national sovereignty, in order to make the changes in the U.N. Charter that are necessary to transform it into a world government. The world government would be provided with a legislature, an executive, and a judiciary. A fair voting system would have to be devised to obtain just representation for each country in the legislative body. Laws would have to be written which would limit the arms of nation-states to those necessary for maintaining internal order. A police force which would owe its primary allegiance to the world government would have to be established and provided with the right of free access to any country.

A proposed draft of a world constitution was released in March 1948 by the *Committee to Frame a World Constitution,* a group of university professors and authors formed (1945) under the leadership of Robert M. Hutchins (*q.v.*).

Organizations, U.S. and foreign, formed to promote the establishment of a world government include the following:

The *United World Federalists,* a merger of five separate world-government groups, was founded (1947) by Cord Meyer, Jr., to advance the establishment of a world federal government, with powers adequate to assure peace, through amendment of the U.N. Charter. *World Republic* (a college group founded in 1946) and *Campaign for World Government* (formed in 1937) seek a world constitutional convention. *Federal Union,* founded by Clarence Streit in 1939, has advocated a league of the Atlantic community, composed of the few democracies that have proved able to guarantee individual liberty, the league later to grow into a world republic. The *Citizens' Committee for U.N. Reform,* established by Ely Culbertson, has worked for disarmament. The *World Movement for World Federal Government* (WMWFG), set up to establish closer contact between world federalist groups and facilitate exchange of ideas on federating Europe and the world, was formed at Luxemburg in September 1946. Organizations aimed at establishing a world government were established in almost all countries after World War II. See also *Brussels Treaty; Europe, Council of.*

World Health Organization (*wûrld hĕlth ôr-găn-ĭ-zā′shŭn*). See *United Nations.*

World History. The history of man in the world falls into two divisions, the vast era of prehistory (*q.v.*) and the "historical" period, which covers only some 6,000 years. The first known manlike creature was *Pithecanthropus erectus* (*q.v.*), in the later Pliocene (*q.v.*) period; genus *Homo,* known as Heidelberg Man (*q.v.*), first appeared about the Third Glacial Age, *ca.* 100,000 B.C. Neanderthal Man (*q.v.*), who followed, *ca.* 50,000 B.C., was succeeded by Crô-Magnon Man (*q.v.*), whose tools and cave paintings tell us much. In the Neolithic (New Stone) Age, some 12,000 to 10,000 years ago, man began to progress notably toward mastery of his environment. His stone implements show skill and foresight; he had domesticated some animals and developed the arts of agriculture, pottery, and weaving.

Then, about 7,000 years ago, man began using metal and his real career as a tool-using creature was under way. The softer metals were the first to be worked, in the Copper Age and the Bronze Age (*q.v.*). In these two or three millennia the wheel came into general use and man showed an increasing mastery of building materials. Such technological advances brought the need for specialization of the sort that makes cities necessary; with the cities came concentration of economic and political power.

Early City-States. These developments at first tended to center in the Near East and Asia Minor, along the great rivers (*e.g.*, Tigris, Euphrates, Nile). One of the first city-states was Sumer; the culture of the Sumerians (*q.v.*) was marked by the development of writing, highly organized religion, and centralized and hereditary political power. Other important states in this area were Babylon and Nineveh (*qq.v.*). Concentrations of power led to conflict, and dominance passed from one nation to another for centuries.

ALEXANDER THE GREAT

The Macedonian conqueror portrayed in an ancient mosaic

Courtesy Bettmann Archive, N.Y.

Courtesy Bettmann Archive, N.Y.

THE COUNCIL OF NICAEA, A.D. 325

Parallel developments took place elsewhere. In Egypt, *ca.* 3600 B.C., several tribes were consolidated under a single monarch. The first four dynasties consolidated the imperial pattern. Generations of internal strife were ended when a Semitic tribe, the Hyksos (*q.v.*), or Shepherd-Kings, conquered Egypt, *ca.* 2200 B.C., founded the 16th Dynasty, and ruled for 500 years until expelled by the natives. The nation later fell to Alexander the Great (*q.v.*) in 332 B.C., afterward remaining a vassal state of one nation or another for more than 2,200 years.

Similar trends showed in China. City-states gradually became feudal allies, then parts of an empire marked by a long series of dynasties. Civilization was also developing during the same general period in India. A particularly notable culture, important for its impact on that of the Greeks, flourished on the island of Crete (*q.v.*) *ca.* 2500-1400 B.C., but was liquidated by conquest *ca.* 1000 B.C.

While trade and manufacture developed inland, islanders and coast-dwellers were learning to travel by sea. The people of Phoenicia (*q.v.*) may have been seafarers as early as 2000 B.C.; they founded the trading cities of Acre, Tyre, Sidon, Utica, and Carthage (*qq.v.*).

All through these four millennia various peoples were making their own cultural growths—on other continents, on islands. Except on the two American continents, however, no other imperial civilizations developed; the cultures of the Incas (*q.v.*) of Peru and the Mayas (*q.v.*) of Yucatan developed considerably later and in virtual isolation.

Ewing Galloway, N.Y.

MECCA, HOLY CITY OF ISLAM

A general view of the central part of Mecca, with the Great Mosque in the center and the Kaaba in the central square of the mosque

Bettmann Archive, N.Y.

THE PEACE OF MÜNSTER

The pact which ended the Thirty Years' War, Oct. 24, 1648, and by which the power of the Holy Roman Empire was lessened

For the Western nations, world history is largely that of the peoples who have made the West what it is. One such influential group was the Jews (*q.v.*), a Semitic people of Mesopotamian origin who appeared in Palestine *ca.* 2000 B.C. After a long captivity in Egypt, they were freed and led by Moses (*q.v.*) to the "promised land" of Canaan *ca.* 1277 B.C. Several notable kings arose, including Saul, David, and Solomon (*qq.v.*), but the nation suffered several conquests, finally falling to Alexander the Great in 332 B.C.; the Jews did not again have a free nation until the founding of the modern state of Israel (*q.v.*).

The Greek Culture. A tribe known as Hellenes, entering the Greek peninsula *ca.* 1500 B.C., absorbed some elements of the Aegean civilization that they conquered and made major developments of their own. Their geographical position made them important seafaring competitors of the Phoenicians; they founded colonies as far away as Marseilles. By the 7th century B.C., the great cities of Athens, Corinth, Sparta, Thebes, Samos, and Miletus (*qq.v.*) were thriving. The Greek city-states, jealously independent, never federated except in wartime. Their government could take the form of oligarchy, aristocracy, republic, democracy (*qq.v.*), or tyranny (see *Tyrant*); the great contribution of Greece to political theory, however, was the principle of democracy.

Cyrus the Great (*q.v.*) and his imperial Persian successors attempted to conquer Greece. Darius I (*q.v.*) was decisively defeated at Marathon (*q.v.*) in 490; and although Xerxes I (*q.v.*) won the pass at Thermopylae (*q.v.*) in 480, a Greek naval victory at Salamis (*q.v.*) turned the tide. Thus freed from danger of conquest, the Greeks faced a period of great cultural development.

An important heritage of Greece is emphasis on individuals rather than on kings and rulers. Here, for the first time, philosophers, orators, historians, authors, and sculptors became known to history by name. Western philosophy is largely founded on that of Greece, among whose notable names are Socrates, Plato, Aristotle, and Democritus (*qq.v.*). Writing became an art; Greek authors include the dramatists Aeschylus, Sophocles, Euripides, and Aristophanes (*qq.v.*), and the historians Herodotus, Thucydides, and Xenophon (*qq.v.*). There were also mathematicians (*e.g.*, Euclid, Pythagoras, *qq.v.*) and statesmen (*e.g.*, Demosthenes, Pericles, *qq.v.*). Despite certain weaknesses in the Greek culture, this period is one of the brightest in Western history. See also *Hellenism*.

The Macedonian Empire. Meanwhile, the Macedonians, another nomadic race, settled north of Greece, were growing powerful. Despite violent opposition, led by Athens, Philip II (*q.v.*) established imperial control. After his assassination (336 B.C.), his son Alexander the Great (*q.v.*) proved himself a powerful force. The first person to envisage a world empire, Alexander got as far as India but died in Babylon at the age of 33. His empire was divided among three of his generals: Seleucus got Asia; Ptolemy, Egypt; and Antigonus, Macedonia. The dynasties set up by Seleucus and Ptolemy survived; Egypt became the most prosperous remnant of Alexander's empire. The city of Alexandria (*q.v.*) remained for years a center of science and culture.

India. A tribe known as Dravidians, perhaps of Mongol origin, had settled in India and developed a strong culture which Aryans (*q.v.*) moving in between 2000 and 1000 B.C. were unable to absorb. The Aryans evolved a highly intermixed group of racial stocks; their principal influence was the imposition of their religion of Hinduism, with its elaborate caste system. Despite some expansionist rulers, India long remained essentially a collection of small states. In the 6th century appeared Gautama, the Buddha (*q.v.*), with a new religion. Although unable to conquer Hinduism in India, Buddhism became a potent influence in much of the rest of Asia and remains so today. See also *Hindu*.

The Roman Republic. By 1000 B.C., Aryan tribes had entered Italy from the north, subduing the native tribes. They encountered and absorbed some of the Greek culture and conquered and learned from the Etruscans (see *Etruria*), a well-developed people of obscure origin who had introduced the vine and the olive to the Italian peninsula.

The city of Rome (*q.v.*), traditionally founded in 753 B.C., grew from a group of villages into a city-state. As Greece gave the Western world the theory of democracy, Rome contributed the idea of written law; the law of the Twelve Tables (*q.v.*), promulgated in 451-450 B.C., became basic. A series of wars brought the unification of Italy under Rome by 265 B.C. During the same period, Carthage, across the Mediterranean, was growing rich and powerful. Rivalry brought on three Punic Wars (*q.v.*) and the complete destruction of Carthage. Rome evolved a policy of conquest and Romanization which lasted for several centuries.

Meanwhile, the government was inevitably changing from republic to bureaucracy. Expansion and conquest provided vast incomes for the few, while the poor grew poorer, thus opening a fertile field for powerful individuals (*e.g.*, Marius, Sulla, Pompey, Julius Caesar, *qq.v.*). Julius Caesar (d. 44 B.C.) was in effect the first of the emperors, as his successors were in fact.

The Roman Empire. The first few emperors—Augustus, Tiberius, Caligula, Claudius, Nero (*qq.v.*)—ruled by consent of the senate. But the overthrow of Nero in A.D. 68 by Galba (*q.v.*), a general, set a pattern, followed by Otho, Vespasian (*qq.v.*), and Vespasian's sons. The next five emperors—Nerva, Trajan, Hadrian, Antoninus Pius, and Marcus Aurelius (*qq.v.*)—were good administrators; Commodus, son of Marcus, was not, and after his assassination emperors were made and broken at will by the armies. In such a state both trade and culture tended to decline. See also *Pax Romana.*

The Byzantine Empire. In the meantime, the Christian Church had become a factor in events. The teachings of Jesus Christ had a considerable appeal in a world whose Egyptian and Oriental religions were losing their potency and whose material circumstances gave not much hope for a desirable future either in this world or the next.

Constantine (*q.v.*), who set up his capital at Constantinople (Byzantium) in 330, recognized the Church and became a Christian himself, thus giving Christianity its long-standing political supremacy in the subsequent Western world. While the Eastern Empire remained strong, the Western Empire grew weaker. Early in the 5th century Rome was attacked successively by the Goths, the Huns, and the Vandals (*qq.v.*), and the final "fall" of the Western Empire occurred when Odoacer (*q.v.*), a German general, displaced the emperor Augustulus (*q.v.*). But Christianity was spreading; the barbarians became Christians, and the essential center of spiritual power remained in Rome. See also *Christianity; Jesus Christ.*

The Middle Ages. By the 5th century the tribal migrations were over and the pattern of modern Europe was taking shape (see *Migration*). The Franks and Burgundians were in France, the Visigoths in Spain, the Vandals in Sardinia, Corsica, and North Africa, the Ostrogoths in Italy, the Lombards north of the Danube. The Slavs held much of Germany, and Great Britain was occupied by Angles, Saxons, Picts, and Scots. (See also articles on the tribes named.) The Eastern Empire made sporadic attempts to recapture some of these areas, without much success. The barbarian kingdoms, however, gradually grew civilized by two means: Christianity, and an apparently natural tendency for a culture to pass from savagery to barbarism to civilization.

In the meantime, the Eastern Empire, becoming more and more orientalized, held off the barbarians successfully and served as a guardian of Christianity against the Persians and others until it fell at last to the Turks in 1453. India alternated between large states and small ones. In China, one province after another rose to power and then declined, although the Tang Dynasty, founded early in the 7th century, ruled for three centuries.

In 570 another influential leader was born: Mohammed (*q.v.*). His religion made great headway, especially when expanded into a militant doctrine by his disciple Abu-Bekr (*q.v.*). Under the dynamism of the new faith, the influence of Islam (*q.v.*) was spread, by both persuasion and force, to Syria, Persia, Mesopotamia, Egypt, and North Africa. These areas developed considerable centers of trade and education, and for many years Islam kept alive the learning which was obscured or partly forgotten in the West.

After the time of Gregory I (*q.v.*), Rome was recognized as the seat of the Pope, the supreme bishop. The Church modeled its organization on that of the Roman state and made Rome once more the capital of an empire. No strong kingdom appeared before that of the Franks; local groups banded together under a powerful local leader, thus setting up the feudal system (*q.v.*). This system guarded worldly goods; by analogy, the idea developed that the Church guarded souls in the same way, and the Church in turn became feudal, holding lands and wielding temporal power, thus opening the way for conflicts between kings and Popes.

The first strong kingdom since the fall of Rome, the Frankish, sprang from the Merovingian (*q.v.*) dynasty. Charles Martel (*q.v.*) stopped the northward expansion of the Moslems at Poitiers in 732. The son of Pepin the Short (*q.v.*), Charlemagne (*q.v.*), extended Christianity and his own influence far beyond the borders of his kingdom.

Meanwhile, Teutonic pagans—Saxons, Angles, Danes, and Northmen (*q.v.*)—were raiding coastal areas, getting as far east as Constantinople. The Northmen established settlements in Iceland and Greenland and touched upon the coast of North America. The duke of Normandy (Norse-held land in France) became ruler of England as William the Conqueror (*q.v.*). All these Teutonic groups gradually accepted Christianity.

The Church, as a political organization, needed temporal alliances. Pope Leo III (*q.v.*) therefore crowned the powerful Charlemagne head of the Holy Roman Empire (*q.v.*) in 800. Four major dynasties followed: Saxon, 962-1024; Salian, 1024-1125; Hohenstaufen, 1125-1250, and Hapsburg, 1273-1806.

Islam and Asia. The Mohammedan drive, stopped at Poitiers in the West, remained powerful in the East. The Seljuks (*q.v.*), a Turkish people, held Asia Minor; Turkish peoples were moving into Central Europe; and the Arabs held Jerusalem, which fact led Pope Urban II (*q.v.*) to suggest the quasi-religious wars known as the Crusades (*q.v.*). The Huns and Mongolians (*qq.v.*) were growing powerful in Asia, under several expansionist leaders, including Genghis Khan, Kublai Khan, and Timur (*qq.v.*). The Ottoman Turks (see *Othman*), driven westward by the Mongols, moved in on the Seljuk Turks in Asia Minor, establishing the Ottoman Empire (to last until the 20th century) and in 1453, by taking Constantinople, extinguishing the Eastern Empire.

The Renaissance. In the 14th century began the movement known as the Renaissance (*q.v.*). The West, rediscovering old learning, went on

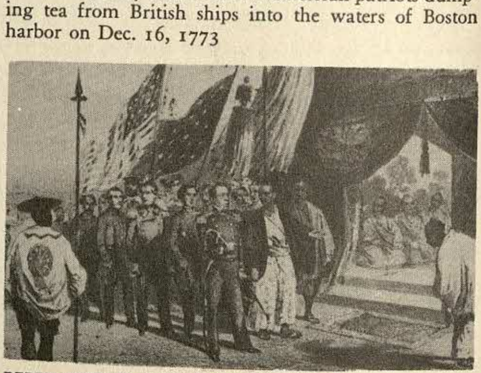
BENJAMIN FRANKLIN

Franklin is shown pleading the cause of the American colonies before the Lords in Council, London, 1774

Pictures Courtesy Bettmann Archive, N.Y.

THE BOSTON TEA PARTY

A contemporary sketch shows American patriots dumping tea from British ships into the waters of Boston harbor on Dec. 16, 1773



PERRY OPENS JAPAN TO THE WEST

Commodore Matthew C. Perry meets the Imperial Japanese commissioners at Yokohama in 1854 to sign a U.S.-Japanese trade agreement

NAPOLEON AT WATERLOO

In this battle the French emperor was defeated, June 18, 1815, by the combined English and Prussian armies

Courtesy Bettmann Archive, N.Y.

SAN MARTÍN AND BOLÍVAR

The two South American leaders are shown meeting at Guayaquil, Ecuador, on July 26, 1822

to new discoveries in geography, science, and art. There was new emphasis on man as an individual, and observation and experience began to replace reliance on "authority." The new individualism led to national languages and national politics and paved the way for the Reformation (*q.v.*). As learning and the power of the trading middle classes increased, men began to question the temporal powers of the Church. The numerous religious wars were simultaneously religious, economic, and political wars, with rulers placing national advantage over the interests of the Church. Major factions were the followers of John Huss, Martin Luther, and John Calvin (*qq.v.*) and the Anglicans (see *Henry VIII*). Much of northern and western Europe became Protestant, and the Church gradually withdrew to countries remaining dominantly Catholic—France, Spain, Italy, and the Holy Roman Empire.

The era of the Renaissance was a period of expanding trade, but the eastward trade routes were blocked by the Ottoman Empire. This fact started a wave of exploration, in which most of the Atlantic nations took part, followed by colonization, most notably by Spain, France, and England in the New World. Most of the native populations conquered were fairly primitive, but the Spaniards found in the Americas the thriving civilizations of the Aztecs and the Incas (*qq.v.*), which promptly fell before the technical superiority of the Europeans.

Monarchy in an Age of Change. From about 1500, for some 400 years world history was increasingly dominated by Europeans; by 1900, few parts of the world had not been at least touched by European influences. One product of the Renaissance was the theory of the "divine right of kings." The first half of the 16th century was dominated by conflicts between Holy Roman Emperor Charles V (*q.v.*), Francis I (*q.v.*) of France, and Henry VIII of England. A series of wars increased the influence of the bankers, including the family of Fugger (*q.v.*), upon the monarchs; at the same time, expanding trade enriched the merchants and gave them more power.

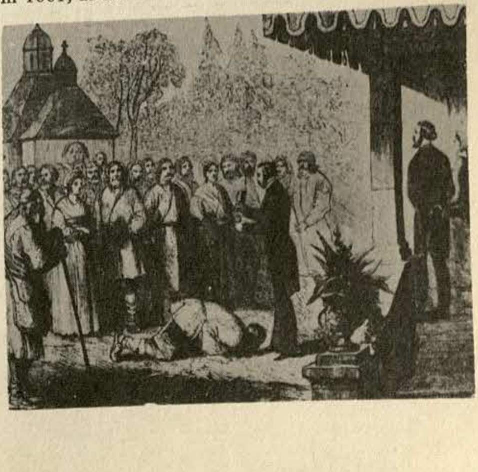
By the opening of the 17th century, the pattern of conflict between monarchs and the merchant classes was set. In England, a civil war limited the power of the monarch (see *Charles I* and *Cromwell, Oliver*). In the Protestant Netherlands, the people won over their Catholic ruler Philip II (*q.v.*) of Spain. The Thirty Years' War (*q.v.*), nominally a religious war, was rooted in economic and dynastic rivalries. In England, the people, in effect, subordinated the monarch to the "commonwealth"; in France, on the other hand, the king became absolute and remained so until the French Revolution (*q.v.*). The Bourbon (*q.v.*) monarchs set an example followed by Frederick (II) the Great of Prussia, Maria Theresa of Austria, and Peter (I) the Great of Russia.

In the 18th century came the Industrial Revolution (*q.v.*), which widened the breach between the landed and mercantile classes and between employer and employee. Industrial capitalism became, for the first time, a power, capable of making and breaking nations, kings, politicians, and individual men.

The New World. In the same period, from 1500 on, the New World had been developing. North America was colonized by England, France, Spain, and Holland. England came to dominate the greater part of North America. The 13 English seaboard colonies revolted against oppressive colonial policy and set up an independent republican government which has survived nearly two centuries of divisive pressures,

SERFS LIBERATED

The emancipation of the Russian serfs by Alexander II in 1861, as shown in a contemporary woodcut



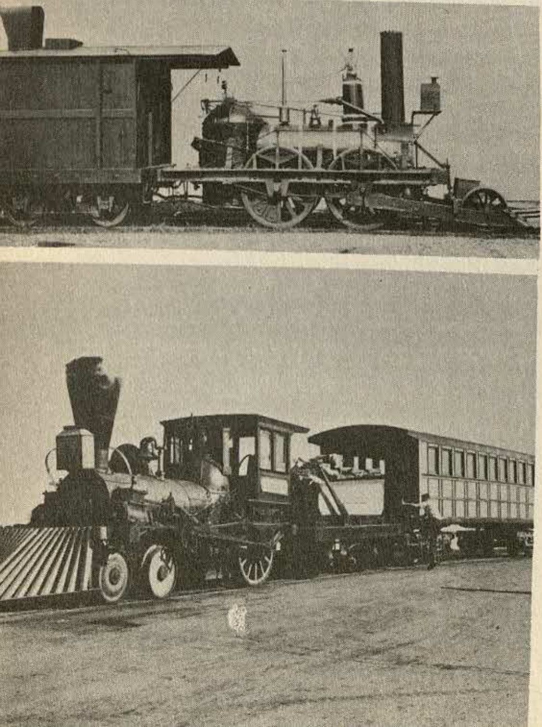
principally those between the proponents of loose federation *versus* centralization. The Spanish colonies in Central and South America, in a series of revolts in the 19th century, rebelled and set up republics of varying degrees of stability. See also *United States:* HISTORY.

The U.S. developed gradually toward its present outlines. Napoleon I (*q.v.*) sold the young republic the area known as the Louisiana Purchase (*q.v.*). An indecisive war with England in 1812 produced at least a "let-alone" policy in Europe. The Mexican War (*q.v.*) added more territory, including gold-producing California. Meanwhile, conflict was brewing between the agrarian South and the industrial North. The Civil War (*q.v.*) was, in essence, a war between the divergent interests of an agricultural slave economy and an industrial, wage-earning one. The principle of union (economic as well as political) won out and produced in large part the mass prosperity of later years.

The French Revolution. By the end of the 18th century, it had become apparent that absolute monarchy stifled development in general, and the middle classes (the *bourgeoisie, q.v.*) were impatient for some share in government. Louis XVI (*q.v.*) was not especially popular and his deficits, and consequent taxes, were crippling. The French Revolution (*q.v.*) was at first moderate; from 1789 to 1791 France was in practice a limited monarchy controlled by the National Assembly. But as the royalists sought to regain control, a radical party known as Jacobins (*q.v.*) came to the fore; faced by royalist recapture of power, they tried and executed the king and queen. The National Convention declared France a republic in September 1792.

EARLY LOCOMOTIVES

The "John Bull" (*top*), originally built in 1831, operated on the Camden & Amboy R.R. in New Jersey. The "Pioneer" (*bottom*), built in 1836, pulled the first train out of Chicago on Oct. 25, 1848



The Reign of Terror which followed called for a strong stabilizing force, who proved to be Napoleon Bonaparte, a ruthless military genius. Idolized by the populace for his aggrandizement of France, he easily made himself emperor. But militant nationalism aroused distrust in neighboring nations, and after some 15 years of widening wars he was defeated at Waterloo (*q.v.*) and exiled.

The Conservative Reaction. The European powers, meeting at the Congress of Vienna (*q.v.*) restored, so far as possible, pre-Napoleonic boundaries and repressed as many popular liberties as they dared. But political conservatism could not permanently repress the growing desire for freedom as the working classes grew in numbers and began to realize their potential weight. In England, reform slowly extended the franchise and improved the condition of the workers. Then, in 1848, a wave of liberalism brought minor revolutions in much of Europe; the principal results were that France became a republic for a second time and many German intellectuals fled to, and thus enriched, the U.S. (see, *e.g., Schurz, Carl*).

The New Nationalism. The 19th century was marked by a new surge of nationalism. Two new major states appeared, Germany and Italy (*qq.v.*). The rise of Germany was largely the work of one man, Prince Otto von Bismarck (*q.v.*). Several wars, culminating in the Franco-Prussian War (1870), unified the German states under the leadership of Prussia, and Bismarck proclaimed the German Empire in 1871. The defeat of Napoleon III (*q.v.*) led to the establishment of the Third French Republic.

With the aid of Napoleon III and the patriot Garibaldi (*q.v.*), parts of Italy were freed from Austrian control, and in 1861 King Victor Emmanuel II (*q.v.*) of Sardinia became the first king of a unified Italy. A few years later the new kingdom took Venice and Rome; a plebiscite cost the papacy its temporal power, and the Pope retired to the Vatican (see *Vatican City*), where subsequent Popes have remained.

Russia, despite sporadic attempts at Westernization, including the freeing of the serfs (1861), remained largely undeveloped. The Crimean War (1854-56) checked her southward expansion; internal dissensions, arising mostly from economic repression, and the Russo-Japanese War (*q.v.*) kept Russia from becoming a major power, except on paper, until World War II. The relatively small Balkan states were either dominated or threatened by Turkey. Greece, Serbia, and Rumania won their freedom; Bulgaria, aided by Russia, did the same. The Western powers sought to prevent a Russian-backed rise of Pan-Slavism (*q.v.*), but the means chosen brought an expansion of the power of Austria-Hungary; this set up rivalries which inevitably culminated in World War I.

The New Imperialism. A new nationalism produced a group of nations who felt themselves to be Great Powers. The period of colonial exploitation had been, in effect, ended by the North and South American revolutions; but the Industrial Revolution created a need for expansive foreign markets, and from then on political and economic imperialism tended to go hand in hand. The new, theoretically benevolent and Christian, imperialism touched all the non-European areas of the world. England still held Canada, and some small areas in the Americas still belonged to European powers; but the American republics were, first nominally, then actually, protected by the Monroe Doctrine (*q.v.*). The rest of the world, however, was subject to control or influence. Britain ruled India and several areas in Africa, and other nations also held or gained new footholds in Africa (*e.g.*, France, Belgium, Spain, Italy, Germany, and Portugal). The Boxer Rebellion (*q.v.*) gave the powers excuse for carving out "spheres of influence" in China. The U.S., by the Spanish-American War (*q.v.*), freed Cuba but, falling heir to the Philippines, was, for a generation, grouped with the imperialist-minded powers.

World War I and After. These economic and political pressures, increasing after 1890, erupted into World War I (*q.v.*) in 1914. The first major conflict of the Great Powers since the Napoleonic Wars, this four-year struggle left Europe bankrupt and disorganized. Nationalism, particularly that of long-suppressed racial groups such as the Poles and Czechs, produced extensive revisions of the map.

The U.S., after its brief excursion into world affairs during the war, returned to "isolationism" and rejected participation in the League of Nations (*q.v.*). England tried to go back to its 19th-century policy of "business as usual." France, plagued by a surplus of political parties, was riddled by governmental corruption. Italy fell under the spell of the demagogic Benito Mussolini (*q.v.*) and developed a form of state socialism called Fascism (*q.v.*). The most important change was in Russia. There a century-old revolutionary movement, which had broken out only to be suppressed in 1905, succeeded in 1917. Under the leadership of Lenin and Trotsky (*qq.v.*), the revolutionists overthrew the autocracy of the czars and set up the Union of Soviet Socialist Republics (*q.v.*), organized according to the socialist-communist doctrines of Karl Marx (*q.v.*).

THE SPANISH-AMERICAN WAR

Colonel Theodore Roosevelt's Rough Riders capture San Juan Hill, Cuba, July 1, 1898, in one of the decisive and spectacular battles of the Spanish-American War

Capitalism, as practiced throughout the rest of the world, was threatened by trade crises, and an epidemic of inflation further wrecked an already bankrupt Europe. Great Britain, though faring better than many other nations, was economically weak from the armistice of 1918 onward. The U.S., which still had an expanding economy protected by high tariffs and had not suffered economically from the war, was able to extend credit. The growing pressures, however, were too great, and the depression that struck the U.S. in 1929 had wide consequences. It touched off a vicious battle for world markets and produced more unemployment than ever before in world history. While business and government fought to save the capitalist structure, many of the unemployed began to look hopefully toward Socialism or Communism (*qq.v.*) as a possible salvation.

Vanquished Germany, in this period of depression, found a leader in the skillful demagogue Adolf Hitler (*q.v.*). By elaborate barter devices he expanded German trade and, taking advantage of the Western world's desire to avoid showdowns, boldly rearmed Germany despite the limitations set up by the Versailles Treaty, until, by 1939, he was able to challenge Europe singlehanded.

In the Far East, the old order was also changing. India, under the inspiration of Mahatma Gandhi (*q.v.*), was demanding self-government, which the British could not afford to give and which they felt the native populations were not yet ready to assume. China, which had become a republic in 1912 and was vaguely trying to "modernize" its governmental structure, was faced by a Westernized and militarized Japan. Successful wars with China and Russia had given Japan confidence, and World War I had given her some former German islands in the Pacific, which later proved most useful in her attempt to conquer Southeast Asia.

World War II and After. By 1930, the chain of events which was to end the "long armistice" was already taking shape. Japan, needing both raw materials and markets, moved into Manchuria (*q.v.*) in 1931, over the feeble protests of the League of Nations. Mussolini, moved by the apparent weakness of the League, took by force the new empire of Ethiopia (*q.v.*). Both Hitler and Mussolini took the civil war in Spain (1936-39) not merely as a chance to help create another dictatorship in Europe but as a test of whether other nations might interfere with larger projects.

Austria, a German-speaking nation, was annexed by Hitler in a *coup d'état;* then, allegedly to "liberate" German-speaking minorities, he succeeded in dismembering Czechoslovakia without interference (see *Appeasement Policy*). Having thus proved to himself that the other nations were neither able nor willing to fight, he protected his flank by a nonaggression pact with Soviet Russia and attacked Poland. But Great Britain and France declared war and World War II (*q.v.*) commenced. Japan later joined Germany and Italy in their war against the Allies, and, after a long and costly struggle, peace was dramatically bought by the atomic bomb (*q.v.*).

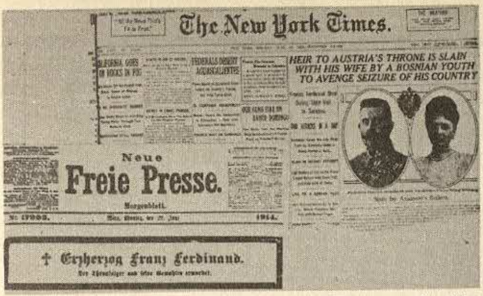
The Western democracies hastily demobilized and sought to return to normal life; Russia kept her forces intact and applied economic and military pressure on her neighbors. With the leading imperialistic nations, Germany, Italy, and Japan, subdued, the world now hoped for lasting peace.

In a few years, however, new problems appeared. The United Nations (*q.v.*), an improved successor organization to the defunct League, was hindered by lack of cooperation from Soviet Russia. In England, the Labour party, in power

COLONIAL TROOPS

Berber infantrymen typify the millions of native African people who fell under European domination in the 19th century. This contingent of Berbers was photographed on maneuvers outside of Rabat, in Morocco, then a protectorate of France. Troops such as these fought on the side of the Western powers in World War II, after the U.S. invasion of North Africa

Courtesy Ewing Galloway, N. Y.



The New York Times.

HEIR TO AUSTRIA'S THRONE IS SLAIN WITH HIS WIFE BY A BOSNIAN YOUTH TO AVENGE SEIZURE OF HIS COUNTRY

Neue Freie Presse.

Morgenblatt.

1914.

† Erzherzog Franz Ferdinand.

Courtesy Bettmann Archive

THE BEGINNING OF WORLD WAR I

Newspaper headlines at New York and Vienna

from 1945 to 1951 imposed a not entirely effective state socialism, bitterly fought by the Conservatives. In France and Italy, Communism was rampant, especially among the long-depressed working classes. In the Near East, agitation and violence were constant, over oil interests, the Suez Canal, the Anglo-Egyptian Sudan, and Arab opposition to the new Jewish state of Israel. In Africa, natives rioted against French control in North Africa and a native terrorist organization tried to undermine the British in Kenya. The Chinese mainland became the (Communist) People's Republic of China as Chiang Kai-shek (*q.v.*) and his Nationalist forces were driven into a long, U.S.-protected exile on Formosa.

Communist pressure tactics and the Western countermeasures came to be known as the "cold war" (*q.v.*), although nominal peace still reigned. In 1950, however, the "occupation state" of North Korea invaded the U.N.-sponsored republic of South Korea. The U.S., with U.N. sanction and aid, undertook to check the aggression by a "police action"; intervention by the Communist republic of China turned the struggle into a long, stalemated war, halted by an armistice in 1953 (see *Korea*). As this fighting ended, a long, undeclared war flared between Viet Minh (Communist) rebels and the French-protected states of Indo-China (*q.v.*), but an armistice in 1954 set up a divided state like that in Korea.

The Western powers worked feverishly to set up, cement, and arm a series of alliances to contain the Communist-bloc nations. They, in turn, continued, directly and indirectly, their tireless probing for soft spots, particularly the Nationalist Chinese "offshore islands" and the Near East. Communist power remained monolithic and unshaken, despite serious revolts in Poland and Hungary (1956) and Tibet (1959). After years of Egyptian agitation, Great Britain in June 1956 ended her long occupation of the Suez Canal Zone; six weeks later, in retaliation for alleged economic discrimination by Great Britain and the U.S., Egypt nationalized the canal. This act provoked a show of force by Israel, France, and Great Britain, which was ended only by the fear of precipitating a general war. By 1959, the nationalization was an accepted fact; but this triumph of Arab nationalism fanned the flame of that movement still further, from North Africa to Iraq, and gave impetus to other nationalistic movements in Africa. Several new states (*e.g.*, Ghana) were set up, and others were obviously in the making. The West was naturally concerned lest these new governments fall under Communist domination; and when a revolution overthrew (Jan. 1, 1959) Cuba's longtime dictator Fulgencio Batista, the shadow of a (possibly) left-wing government there fell on the vitally important Panama Canal.

On Oct. 4, 1957, the Soviet Union opened a new era in world history by launching the first man-made earth satellite. This development set off a race, largely dominated by the U.S.S.R. and the U.S., which dwarfed all previous arms races—a race for the scientific and military domination of outer space (see *Astronautics*). Almost simultaneously came two other developments of potentially vast significance: one was a growing drive on the part of the U.S.S.R. to win economic (rather than military) domination of the "undeclared" nations; the other was the colossal attempt of Communist China to industrialize herself virtually overnight. Meanwhile, the world also became conscious of another factor which might affect mankind more than anything else in recorded history. Knowledge of atomic fall-out (*q.v.*) from test explosions of atomic and hydrogen bombs was not new; but it became increasingly clear that pre-existing fall-out would take years or decades to settle, and, in the meantime, the scientists were not certain how these radioactive elements might affect human genetics. It began to seem vital that the nations find some sure way to end both bomb-testing and the fears of nuclear war; but any solution inevitably awaited the easing of international tensions.

See also separate articles on nations mentioned in this article.

World Powers (*wûrld pow′ẽrz*). See *Powers, the Great.*

World Revolution (*wûrld rĕv-ō-lū′shŭn*), a term derived from the "Manifesto" of the Communist League, the first call for a world revolution (published by Karl Marx and Friedrich Engels, 1848): "Society is more and more splitting up into two great hostile camps: *Bourgeoisie* and Proletariat. *Bourgeoisie* felled feudalism, but it has forged the weapons that bring death to itself; it has also called into existence the men who are to wield those weapons—the modern working class—the proletarians. Let the ruling class tremble at a Communistic revolution. The proletarians have nothing to lose but their chains. They have a world to win." See also *Communism; Socialism.*

WORLD SERIES THRILLS

At left is the scene after New York Yankee Don Larsen pitched the first World Series no hitter—against Brooklyn, Oct. 8, 1956. Above is Bobby Richardson sliding home to score and demonstrate the spirit that won the 1962 Series for the Yankees in a seven-game duel with the San Francisco Giants

WORLD SERIES GAMES—1903-

Date	*Winner*	*Loser*	*Score*[1] *W.*	*L.*	*Final Game Played at*
1903	Boston, A.L.	Pittsburgh, N.L.	5	3	Boston
1905	New York, N.L.	Philadelphia, A.L.	4	1	New York
1906	Chicago, A.L.	Chicago, N.L.	4	2	Comiskey Park
1907	Chicago, N.L.	Detroit, A.L.	4	0	Detroit
1908	Chicago, N.L.	Detroit, A.L.	4	1	Detroit
1909	Pittsburgh, N.L.	Detroit, A.L.	4	3	Detroit
1910	Philadelphia, A.L.	Chicago, N.L.	4	1	Chicago
1911	Philadelphia, A.L.	New York, N.L.	4	2	Philadelphia
1912	Boston, A.L.	New York, N.L.	4	3	Boston
1913	Philadelphia, A.L.	New York, N.L.	4	1	New York
1914	Boston, N.L.	Philadelphia, A.L.	4	0	Boston
1915	Boston, A.L.	Philadelphia, N.L.	4	1	Philadelphia
1916	Boston, A.L.	Brooklyn, N.L.	4	1	Boston
1917	Chicago, A.L.	New York, N.L.	4	2	New York
1918	Boston, A.L.	Chicago, N.L.	4	2	Boston
1919	Cincinnati, N.L.	Chicago, A.L.	5	3	Chicago
1920	Cleveland, A.L.	Brooklyn, N.L.	5	2	Cleveland
1921	New York, N.L.	New York, A.L.	5	3	Polo Grounds
1922	New York, N.L.	New York, A.L.	4	0	Polo Grounds
1923	New York, A.L.	New York, N.L.	4	2	Polo Grounds
1924	Washington, A.L.	New York, N.L.	4	3	Washington, D.C.
1925	Pittsburgh, N.L.	Washington, A.L.	4	3	Pittsburgh
1926	St. Louis, N.L.	New York, A.L.	4	3	New York
1927	New York, A.L.	Pittsburgh, N.L.	4	0	New York
1928	New York, A.L.	St. Louis, N.L.	4	0	St. Louis
1929	Philadelphia, A.L.	Chicago, N.L.	4	1	Philadelphia
1930	Philadelphia, A.L.	St. Louis, N.L.	4	2	Philadelphia
1931	St. Louis, N.L.	Philadelphia, A.L.	4	3	St. Louis
1932	New York, A.L.	Chicago, N.L.	4	0	Chicago
1933	New York, N.L.	Washington, A.L.	4	1	Washington, D.C.
1934	St. Louis, N.L.	Detroit, A.L.	4	3	Detroit
1935	Detroit, A.L.	Chicago, N.L.	4	2	Detroit
1936	New York, A.L.	New York, N.L.	4	2	Polo Grounds
1937	New York, A.L.	New York, N.L.	4	1	Polo Grounds
1938	New York, A.L.	Chicago, N.L.	4	0	New York
1939	New York, A.L.	Cincinnati, N.L.	4	0	Cincinnati
1940	Cincinnati, N.L.	Detroit, A.L.	4	3	Cincinnati
1941	New York, A.L.	Brooklyn, N.L.	4	1	Brooklyn
1942	St. Louis, N.L.	New York, A.L.	4	1	New York
1943	New York, A.L.	St. Louis, N.L.	4	1	St. Louis
1944	St. Louis, N.L.	St. Louis, A.L.	4	2	Sportsman's Park
1945	Detroit, A.L.	Chicago, N.L.	4	3	Chicago
1946	St. Louis, N.L.	Boston, A.L.	4	3	St. Louis
1947	New York, A.L.	Brooklyn, N.L.	4	3	New York
1948	Cleveland, A.L.	Boston, N.L.	4	2	Boston
1949	New York, A.L.	Brooklyn, N.L.	4	1	Brooklyn
1950	New York, A.L.	Philadelphia, N.L.	4	0	New York
1951	New York, A.L.	New York, N.L.	4	2	Yankee Stadium
1952	New York, A.L.	Brooklyn, N.L.	4	3	Brooklyn
1953	New York, A.L.	Brooklyn, N.L.	4	2	New York
1954	New York, N.L.	Cleveland, A.L.	4	0	Cleveland
1955	Brooklyn, N.L.	New York, A.L.	4	3	New York
1956	New York, A.L.	Brooklyn, N.L.	4	3	Brooklyn
1957	Milwaukee, N.L.	New York, A.L.	4	3	New York
1958	New York, A.L.	Milwaukee, N.L.	4	3	Milwaukee
1959	Los Angeles, N.L.	Chicago, A.L.	4	2	Chicago
1960	Pittsburgh, N.L.	New York, A.L.	4	3	Pittsburgh
1961	New York, A.L.	Cincinnati, N.L.	4	1	Cincinnati
1962	New York, A.L.	San Francisco, N.L.	4	3	San Francisco

[1] W. equals games won by winning team; L. equals games won by losing team.

World Series (*wûrld sēr′ēz*), in baseball (*q.v.*), a series of postseason games played between the two major leagues. Each league is represented by the league pennant winner, that team which has won the highest percentage of its scheduled games during the regular season. Occasionally, a play-off must be held to determine the league winner, but only one winner can be named. These teams then meet for an indeterminate number of games, played alternately in the cities where the teams originate, until one team has won four games. This is usually a seven-game series, although only the first four games need be played if one team wins them all. The team that wins the series is known as the "world champion."

The gate receipts for these games are distributed among the series players (and players of second, third, and fourth-place teams in each league), the team owners and the leagues, and the commissioner's office, according to proportions set up ahead of time. The players share in the proceeds of the first four games only.

The American League and the National League have been represented in these series since 1903—except for 1904, when there was no series. Those series held between 1882 and 1890 were between leagues which do not exist today and the present-day National League, but they were played under different rules. The series is held in the fall of the year, usually in early October.

The results of the series since 1903 are shown in the accompanying table, and the standings of the various clubs (both tables refer to cities in which teams played) with respect to the series are shown in a separate listing. One team, the American League's New York Yankees, has won more series than any other team. The team ranking highest in the National League is St. Louis; although New York (team went to San Francisco, 1957), Chicago, and Brooklyn (team went to Los Angeles, 1957) have each played in more series than St. Louis, they have won fewer world championships.

WORLD SERIES WINNERS—1903-1962

Franchise City	*Played*	*Won*
	American League	
Boston	6	5
Chicago	4	2
Cleveland	3	2
Detroit	7	2
New York	27	20
Philadelphia	8	5
St. Louis	1	0
Washington	3	1
	National League	
Boston	2	1
Brooklyn	9	1
Chicago	10	2
Cincinnati	4	2
Los Angeles	1	1
Milwaukee	2	1
New York	14	5
Philadelphia	2	0
Pittsburgh	5	3
St. Louis	9	6
San Francisco	1	0

World War I (*wûrld wôr wŭn*) or FIRST WORLD WAR, a military conflict between the Central Powers (Germany, Austria-Hungary, Bulgaria, and Turkey), and the Allies, chief among which were Great Britain, France, Russia, and the U.S. The war raged with unprecedented violence from July 28, 1914, to Nov. 11, 1918, eventually involving 27 nations and more than nine-tenths of the global population. Nearly twice as many deaths resulted from World War I as from all the wars fought from 1790 through 1913; the enormous costs of the war as well as property damage resulted in hugely increased national debts in all the belligerent countries.

The primary causes of this upheaval are buried deep in the social and political history of Europe. Many historians believe that the seeds of the struggle lay in racial movements and nationalistic urges starting as far back as the Middle Ages. Others date the start of conflict from the last quarter of the 19th century, after Chancellor Bismarck (*q.v.*) had consolidated the German states into a unified empire with a claim to world power. Some point to the failure of British diplomacy to maintain a European balance of power; others argue that the minorities of the Austro-Hungarian monarchy and those of the former Ottoman Empire (Turkey) in the Balkans created pressures which were bound to erupt into war. Marxist economists charge that World War I resulted from the struggle for world markets and merely marked a crisis for capitalism. In any case, the immediate causes may be said to be these: (1) the rapid trend of Germany after 1871 toward militarization and colonial expansion; (2) the mutual hostility of France and Germany resulting from the Franco-Prussian War; (3) spheres of influence in the Balkans, bitterly contested by Russia and Austria; (4) Slavs and Italians under Austrian rule who clamored for autonomy or annexation to the mother countries; (5) the formal resolution of the opposing nations into two groups, the Triple Alliance (Germany, Austria, and Italy) and the Triple Entente (England, Russia, and France).

This complex powder keg was ignited by the assassination (June 28, 1914) in Sarajevo, Bosnia, of Archduke Francis Ferdinand (*q.v.*), heir apparent to the Austro-Hungarian throne, by Gavrilo Princip, a Bosnian revolutionary. On July 23 Austria, on assurances that Germany would support any Austrian action, presented a harsh ultimatum to Serbia. Although Serbia replied in a conciliatory tone, Austria severed diplomatic relations and ordered immediate mobilization.

The general tension was now too great to admit of pacification. Germany, Austria-Hungary, France, Great Britain, and Russia were already organized to the point where complete military mobilization was the inevitable next step. On July 28, an avalanche of war declarations was precipitated when Austria informed Serbia that a state of war existed. Refusing to accept a proposal by the British foreign secretary, Sir Edward Grey, to submit the Serbian question to arbitration by a commission representing France, Germany, Italy, and Great Britain, Austria closed the door on further negotiations. An artillery bombardment on Belgrade, the Serbian capital and an unfortified city, was begun on July 29.

DECLARATIONS OF WAR

The assassination at Sarajevo and the bombardment of Belgrade thrust upon the world the first great mass conflict that it had ever known—a war which involved more peoples than ever before in the history of mankind. Prior to the outbreak of hostilities the peacetime armies of Austria-Hungary, Germany, Great Britain, France, Russia, Italy, and the U.S. barely totaled 4,500,000; before the Armistice was signed (Nov. 11, 1918) the total mobilized forces of these seven powers reached 58,000,000. But even these figures do not give a clear picture of how tremendously the prewar armies were expanded or of the exact magnitude of the conflict. Germany, with an army of 4,000,000 in July 1914 (800,000 standing army; 3,200,000 trained reserves), had mobilized 11,000,000 men by November 1918; Russia, with an army of 6,000,000 in July 1914 (1,300,000 standing army; 4,700,000 trained reserves), had mobilized 12,000,000 by the time of her retirement from the conflict (March 1918); and the U.S., with an army of 200,000 at the time of her entrance into the conflict on Apr. 6, 1917 (130,000 standing army; 70,000 trained reserves), had mobilized a force of 4,355,000 by November 1918. Before the war was over 93 per cent of the world's population had been involved; the countries classed as neutrals had a total population of 130,000,000, and the countries classed as belligerents had a total population of 1,700,000,000.

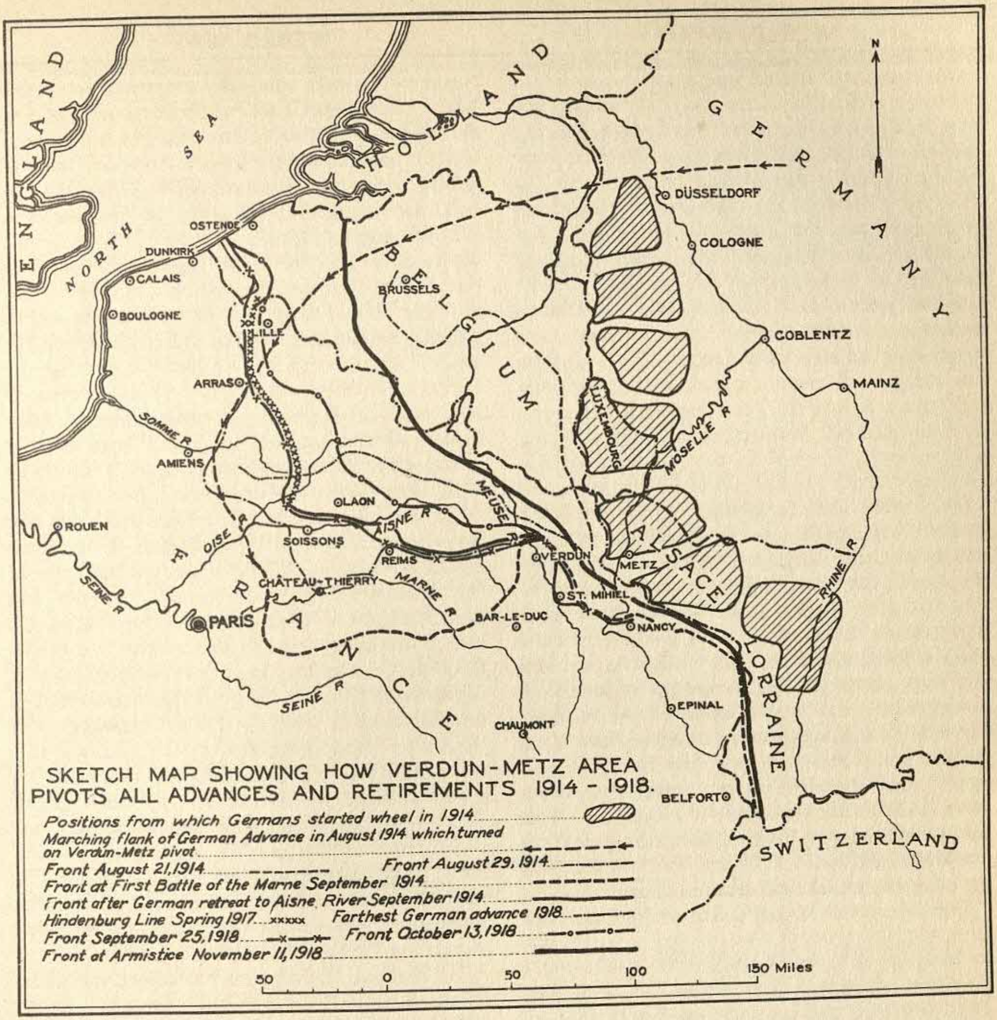
Never before had so many men been engaged in one war, and never before had one war been so complex. Twentieth-century inventions had combined to make the battle severer than ever before. The tank, the airplane, the machine gun, gas warfare, and gigantic systems of trenches were all successfully used for the first time, and as a result ancient techniques of waging war had to be revised in payments of life and money.

Just a few hours after the Austro-Hungarian bombardment of Belgrade, Russia ordered mobilization against the Dual Monarchy. France pledged Russia her full co-operation, and within a matter of days complete warfare had broken out. On Aug. 1 Germany declared war against Russia; on Aug. 3 Germany declared war against France; and on Aug. 4 Germany declared war against Belgium despite previous pledges to respect her neutrality. Following the German invasion of Belgium, Great Britain, who had unsuccessfully attempted to avert war by requesting the Powers to meet and discuss their grievances, declared war on Germany. In rapid succession almost every nation in Europe joined the fray. (See table of declarations of war, below.)

At the outset Germany and Austria-Hungary felt confident of victory. Germany had quickly defeated France in 1870, and since then both the German and Austro-Hungarian armies had vastly improved. The Germans believed their army was large enough and well-trained enough for the task that lay ahead. The general staff was believed excellent, the minor officers were well trained, and the common soldiers were obedient and attached to their officers. The German High Command was confident it would be a quick war; first a paralyzing thrust at France, then at Russia. Austria-Hungary, they believed, would quickly dominate little Serbia. All this, however, was not the case.

Dates of War Declarations

1914, July 28—Austria vs. Serbia.
Aug. 1—Germany vs. Russia.
Aug. 3—Germany vs. France.
Aug. 4—Germany vs. Belgium.
Aug. 4—Great Britain vs. Germany.
Aug. 6—Austria vs. Russia.
Aug. 8—Montenegro vs. Austria.
Aug. 9—Austria vs. Montenegro.
Aug. 9—Serbia vs. Germany.
Aug. 9—Montenegro vs. Germany.
Aug. 12—France vs. Austria-Hungary.
Aug. 12—Great Britain vs. Austria.
Aug. 23—Japan vs. Germany.
Aug. 24—Austria vs. Belgium.
Aug. 27—Austria vs. Japan.
Nov. 3—Russia vs. Turkey.
Nov. 5—Great Britain vs. Turkey.
Nov. 5—France vs. Turkey.
1915, May 23—Italy vs. Austria.
May 24—San Marino vs. Austria.
Aug. 20—Italy vs. Turkey.
Oct. 14—Bulgaria vs. Serbia.
Oct. 15—Great Britain vs. Bulgaria.
Oct. 18—France vs. Bulgaria.
Oct. 19—Italy vs. Bulgaria.
Oct. 19—Russia vs. Bulgaria.
1916, Mar. 8—Germany vs. Portugal.
Mar. 10—Portugal vs. Germany.
Mar. 15—Austria vs. Portugal.
Aug. 27—Rumania vs. Austria.
Aug. 27—Italy vs. Germany.
Aug. 28—Austria-Hungary vs. Rumania.



SKETCH MAP SHOWING HOW VERDUN-METZ AREA PIVOTS ALL ADVANCES AND RETIREMENTS 1914 - 1918.

Aug. 28—Germany vs. Rumania.
Aug. 31—Bulgaria vs. Rumania.
Aug. 31—Turkey vs. Rumania.
1917, Apr. 6—United States vs. Germany.
Apr. 7—Panama vs. Germany.
Apr. 7—Cuba vs. Germany.
Apr. 27—Guatemala vs. Germany.
May 17—Honduras vs. Germany.
May 18—Nicaragua vs. Germany.
June 17—Haiti vs. Germany.
June 29—Greece vs. Germany.
June 29—Greece vs. Turkey.
June 29—Greece vs. Bulgaria.
July 2—Greece vs. Austria.
July 22—Siam vs. Germany.
Aug. 4—Liberia vs. Germany.
Aug. 14—China vs. Germany.
Sept. 21—Costa Rica vs. Germany.
Oct. 26—Brazil vs. Germany.
Dec. 7—United States vs. Austria.

Nations Involved

Central Powers, 4; Allies, 24.

The Western Front

Germany ordered mobilization on Aug. 1. On Aug. 12 the process was completed, and on Aug. 15 mobilization in France was completed. However, the German High Command did not wait for complete mobilization, and on Aug. 2 it informed the governments of Belgium and Luxemburg that German armies intended to traverse their countries to attack France. Luxemburg was too small a state to protest, but on Aug. 3 the Belgian government refused the Germans permission to cross their country and resolved to defend the country to the utmost. The following day 12 regiments of German cavalry crossed into Belgium forcing a weak resistance force back to Liége. The resulting battle of Liége and the quick German capture of the city (Aug. 15) marked the first step of the so-called "Schlieffen Plan," as drawn up by Count von Schlieffen, chief of the German general staff from 1891 to 1907. Under this plan the German forces were to sweep around France through Belgium, invading France from the north rather than from the east as France expected. With the majority of the German forces sweeping in from the north, another German force was to attack from the east, completely pocketing the French troops. Though a masterpiece of strategic conception, the Schlieffen Plan was so modified during the course of battle by Gen. von Moltke (*q.v.*), who succeeded Schlieffen as the German chief of staff, that it failed to produce the expected results. Moltke so weakened the right wing, or main German army, by sending troops to the Eastern Front to stem the Russian advances in East Prussia that the right wing lacked the necessary mass to accomplish the planned envelopment. The right wing did, however, manage to capture most of Belgium, advancing through Brussels, Charleroi, and Mons, and by early September it had practically reached Paris. Augmented by British troops (who had crossed the English Channel on Aug. 22), the French put up their first real resistance at the so-called First Battle of the Marne (Sept. 6-12, 1914), when the Germans were practically at the gates of Paris. However, the Germans were halted and their entire plan of campaign was wrecked.

This battle was fought on a line 90 m. long, but on a line, at some points, no more than 12 m. distant from Paris. Despite the heavy French losses (more than half the total 300,000 casualties were Allied forces) the French soldiers had lived up to the order of their commanding general, Joseph Joffre (*q.v.*): "We have but one business on hand—to attack and repel the enemy."

Following their virtual defeat at the Marne the Germans retreated some 40 m. north to the Aisne River. Here began a war of attrition as amplified by ingenious systems of trenches—warfare which was to continue for the rest of the war. Two opposing trench fortification lines were constructed from the Oise River in Belgium to the Swiss border. Varying in depth from 3 to 10 ft., these bulwarks were often no more than 50 ft. apart, although the average distance was mostly several hundred feet. The sector between the opposing trenches was known as "No Man's Land," and it was across this strip of land that so many unsuccessful forays were waged. As the battle continued both sides developed their trench systems, until they gradually became little more than myriad passageways connecting entire armies. The importance of these systems cannot be underestimated, for it was here that a major portion of the war was waged. Through these systems of intrenchments the war in the West lost its character of free movement and settled down to what was essentially a vast siege operation, punctuated by bloody forays of either side to effect a break-through. Outstanding among these attempts was the so-called "Race to the Sea" (September to December 1914) in which both sides extended their lines into Flanders toward the Channel ports. It was during this "race" that Erich von Falkenhayn, who succeeded Moltke as the German chief of staff, delivered a series of attacks against the British in what has become known as the First Battle of Ypres (Oct. 20-Nov. 22). The British line held, however, and the last chance of a quick German victory in the West irrevocably faded away.

From Illustrated London News

ALLIED MACHINE GUNNERS

Supporting a foray into "no man's land," using shell craters as shelter

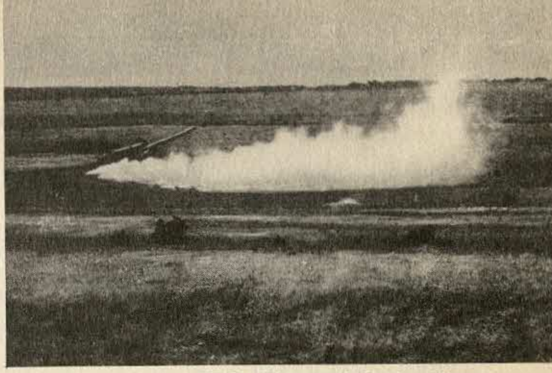
Throughout 1915 the trench deadlock was maintained. Although there were a few major efforts to effect a break-through, all resulted in minute gains and tremendous losses. Notable among these Allied efforts was the Second Battle of Ypres (Apr. 22-May 2) in which the Germans used gas in warfare for the first time in modern history (killing some 6,000 Canadian troops); the Battle of Loos (Sept. 23-Oct. 19) in which solely British troops engaged the enemy; and the Battle of Champagne (Sept. 25-Oct. 8) in which solely French troops attacked the enemy forces.

Although the Germans had been making steady progress along the Eastern Front they had not achieved any great victory in the West since being halted at the Marne the previous year. Early in 1916 the High Command decided that Verdun, long a key point in the French defenses, should be their next point of attack. On Feb. 21, the Germans began an extremely heavy cannon fire, continuing the battle for 193 days in what was probably the greatest mass attack of the war. With the Germans under the direct leadership of the Kaiser and the French under Marshal Henri Pétain (*q.v.*), the Allied defenders took up the watchwords, "They shall not pass." In order to aid the tiring French forces at Verdun the British opened an offensive in the Somme Valley on July 1. Through this maneuver the British forced the Battle of Verdun to a slow-down and a final end on Sept. 3, with the Battle of the Somme Valley ending on Nov. 18. At Verdun the Germans had moved 3½ m. nearer that city, but at the Somme the English had advanced some 5 m. into the territory formerly held by the Germans. German casualties at Verdun were 427,000 killed, wounded or missing; French casualties were 535,000. Total German casualties at the Somme were 445,322; British casualties were 419,654.

Early in 1917 the Germans fell back to the Arras region, establishing a new system of trenches from Cambrai to St. Quentin, called the *Siegfried Stellung,* or Hindenburg Line, after the newly appointed chief of staff, Paul von Hindenburg (*q.v.*).

Through the winter of 1916-17, however, hostilities along the Western Front were delayed while the Central Powers unsuccessfully sought to end the war through diplomacy. Germany and her Allies had long hoped that Woodrow Wilson (*q.v.*), the President of the U.S., would propose some peace settlement. From almost the very beginning of the war Wilson had considered offering his good offices to the nations at war, and in January 1915 he had sent Col. E. M. House (*q.v.*) to Europe as his private representative to learn the attitude of the belligerents toward mediation. Although every state seemed to want peace, House discovered that no government was willing to concede enough to obtain it. Again in 1916, House traveled to Berlin, Paris, and London, but this time the Allies seemed determined to fight the enemy to the bitter end. On Dec. 12, 1916, the German government, however, sent a note to the Allies stating that the Central Powers were willing to propose peace negotiations. Because the German message failed to indicate any concrete terms and because the Allies expected to win and impose their own terms it was rejected by the Allies on Dec. 30.

In addition to the efforts of the German government to end the war in December 1916 there were numerous other similar endeavors. Both the Pope and Charles, Emperor of Austria, appealed to the belligerents to end hostilities. In addition, the members of the Socialist parties based their party platforms on a peaceful termination of the war; they were, however, constantly in the minority.



From Illustrated London News

POISON GAS BEING USED FOR THE FIRST TIME, APRIL 1915

German troops laying poison gas during the Second Battle of Ypres

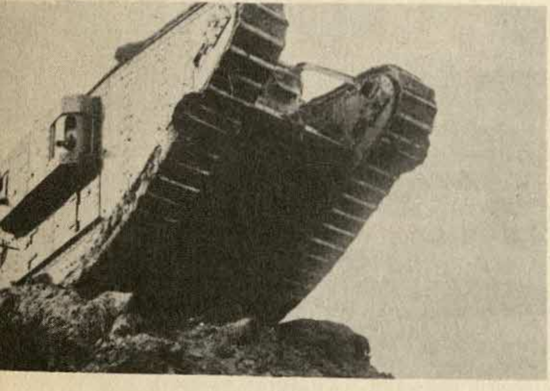
In the meantime relations between the U.S. and Germany went from bad to worse, particularly because of the German attacks upon shipping by means of submarines, or U-boats (from the German *Unterseeboot*) as they were called. America had declared her neutrality on Aug. 4, 1914; but on May 1, 1915, the American oil tanker *Gulflight* had been torpedoed off the coast of Sicily; on May 7, 1915, the English passenger ship *Lusitania* (*q.v.*) had been sunk by a German submarine off the coast of Ireland with the loss of 114 Americans, and a number of American ships had been similarly destroyed. Sentiment in the U.S. had been steadily mounting against Germany, as a result of her naval operations as well as Allied propaganda and the activities of German undercover agents, such as the Black Tom Explosion (*q.v.*). On Jan. 31, 1917, came what was considered the last straw: Germany announced the resumption of an "unrestricted" campaign of submarine warfare. Three days later, after German refusal to abandon the policy, the German ambassador to the U.S. was handed his papers and diplomatic relations between the two nations were severed. On Feb. 26, the British liner *Laconia* was sunk with the loss of eight American lives, and, on Mar. 12, by Executive Order, the American government ordered the arming of all merchant ships. Within a week three American merchant ships had been sunk by German submarines and by Apr. 1, 35 more Americans had lost their lives in similar sinkings. These acts undoubtedly constituted "overt" acts and anti-German feeling within the U.S. reached a new peak.

On Apr. 2, President Wilson went before a joint session of Congress to denounce the recent German acts. During the next two days Congress adopted declarations of war by large majorities (House, 373-50; Senate, 82-6) and on Apr. 6 the President issued a proclamation stating that "war exists between the United States and the Imperial German government."

The U.S. met her new Allied obligations in four ways: by contributing money and food, ships to convey food, help against the submarines, and actual manpower. To counteract the submarine menace the U.S. immediately seized all enemy merchant ships in American waters and simultaneously started a tremendous domestic ship-

TRENCH WARFARE

Part of the original Canadian trenches at Vimy Ridge, reinforced with concrete sandbags



From Illustrated London News

TANK WARFARE AT CAMBRAI, 1917

The successful use of the tank marked a new era in modern warfare which reached its climax in the *blitzkrieg* of World War II

building program. To raise money Congress authorized the War Finance Act and the subsequent raising of almost $20,000,000,000 through "Liberty Loans." To provide food, Congress passed special food control and shipping laws, and to provide manpower, authorized the Selective Service Act, whereby some 9,500,000 men between the ages of 21 and 30 were registered for the so-called "draft."

Although the Germans had forsworn offensive fighting for 1917, the Allies were bent on driving the enemy back. Bolstered by the news of the entry of the U.S. into the conflict, the Allies opened an offensive against the Hindenburg Line in early April. In what was considered the most brilliant feat of arms in the four years of trench warfare, the British under Edmund Allenby (*q.v.*) and the Canadians under Julian Byng (*q.v.*) opened the offensive in the Arras sector. After a fortnight's fighting (Apr. 9-23) the British and Canadian troops managed to gain Vimy Ridge, gaining in all 75 sq. m.—at a cost of 30,000 killed and 70,000 wounded.

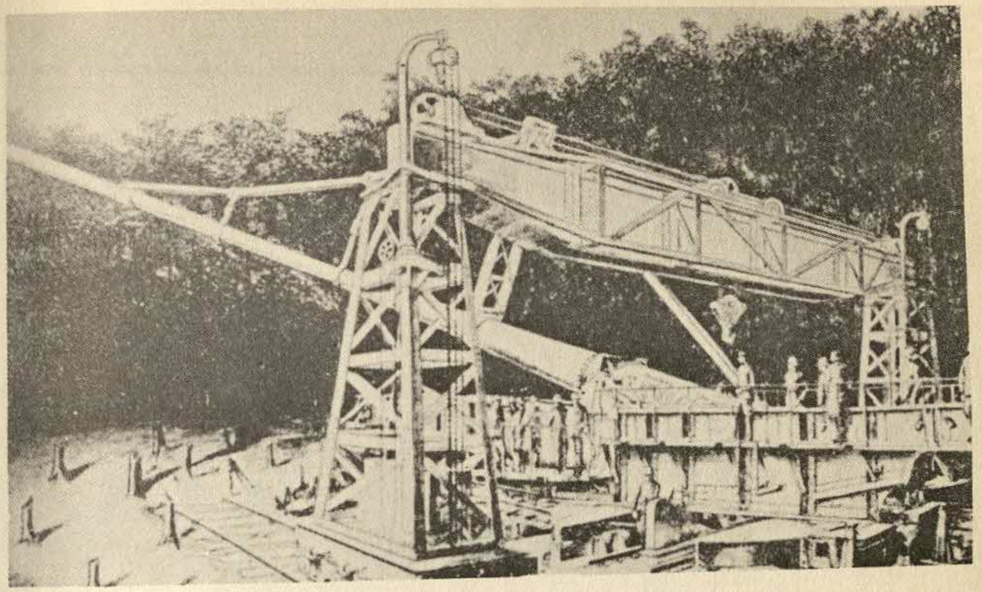
The French part of the offensive was launched in the Champagne, east and west of Rheims, on Apr. 16. The offensive was directed by Gen. Nivelle, who had succeeded Joffre as generalissimo of the French army, but it was met by one of the bloodiest repulses in the entire war. The entire French army suffered complete demoralization and Pétain was named to succeed Nivelle. As a result of the failure of the Nivelle offensive, and subsequent widespread mutiny among French forces, Pétain's troops played no further part in the 1917 Allied offensive, thereby leaving the British and Canadian armies to bear the brunt of the campaign.

In quick succession came the Battle of Messines (May 21-28), the Third Battle of Ypres (June 7-Nov. 4), and the Battle of Cambrai (Nov. 20-Dec. 7), where tanks were successfully used for the first time. From Vimy Ridge to Cambrai the Allies continued pounding at the German wall. The enemy had lost the offensive and the Allies were trying to push forward. At best, however, the gains were small and the costs high.

By the beginning of 1918 all of Europe was weary of war. Austria, Bulgaria, and Turkey (who had joined the hostilities in August 1914, September 1915, and November 1914, respectively), were at the limit of their strength and their people had become apathetic. American aid had not yet arrived on a large scale, and, most important of all, by concluding the war against Russia (see Eastern Front later in this account) Germany was in a position to wage one final offensive. By mid-March three German armies were concentrated on a 45-m. front betwen Arras and La Fère. Gens. Erich von Ludendorff (*q.v.*) and Hindenburg, who had so successfully prosecuted the German campaign in East Prussia, described the task ahead as "the greatest in military history." On Mar. 21, the German offensive began; by Apr. 5, their

"OVER THERE" IN 1918

American troops marching in review before General Pershing (*second from left*) somewhere in France



GERMAN LONG-RANGE CANNON AIMED AT PARIS IN 1918

Throughout the war, Germany resorted to the use of horror weapons to damage civilian morale rather than to gain effective military advantage. A long-range cannon, capable of firing shells more than 70 miles, was aimed at Paris, while London was bombarded from the air by Zeppelins

armies had gained 1,500 sq. m. in the middle of the line between St. Quentin and Amiens, inflicting some 160,000 casualties upon the British defenders. In quick succession they continued their attacks. In April, the Germans attacked the British on the Lys River in Flanders; in May the French on Chemin-des-Dames; in June the French around Compiègne; and in July the French around either side of Rheims. Although constantly victorious, the Germans had gradually exhausted their reserves. They had inflicted some 800,000 casualties upon the Allies, but at no time had they managed to break through or divide the Allied forces.

In the meantime the Allies had been united under one supreme commander, Ferdinand Foch (*q.v.*), and were being considerably bolstered by the steady flow of American replacements.

In July came the turning point. On July 14, the German armies resumed their advance, planning to cross the Marne and enter Paris—only to be met by onrushing French tanks. For the first time since March the German offensive was halted and the enemy driven back. By early August fighting had developed all along the line. Now Foch struck where and as he pleased. The British advanced over the old Somme battlefields, driving the enemy back to the Hindenburg Line. The French advanced relentlessly in the Champagne. The Americans, under Gen. John J. Pershing (*q.v.*), won their first action under their own officers at St. Mihiel in September and, on Sept. 20, began their seven-week battle in the Meuse-Argonne. Since the beginning of the March offensive the Germans had lost 1,000,000 men and almost all divisions were continually fighting at half strength. By May, American troops were landing in France at the rate of 250,000 a month, and by July 1 there were more than 1,000,000 American troops overseas; by November, the number had increased to 2,000,000 (American troops had first been put into a quiet sector of the line near Nancy in October 1917, suffering their first casualties Nov. 3, 1917, at the Rhine-Marne Canal. Their first major action, however, took place in May 1918 at Cantigny in the Amiens salient.)

The German defeat was at hand. The people at home knew it; the men in the trenches knew it; and the leaders knew it. On Sept. 29, the High Command resolved that Germany, already deserted by her allies (as we shall later see) and facing overwhelming military defeat, must appeal to President Wilson for an armistice. The following day, Chancellor Georg von Hertling resigned; on Oct. 26 Ludendorff, the military master who meanwhile had also assumed undue political influence, resigned. Von Hindenburg, however, remained in command. Within the next few days general revolt spread throughout all of Germany and Austria-Hungary. On Nov. 9, the Kaiser, faced with no alternative, renounced his throne; the following dawn he left for The Netherlands and the life of an exile.

Allied discussions for the German armistice had been under way in Paris since October. On Nov. 8, in the carriage of Foch's special train in the Compiègne Forest the German Armistice Com-

RUSSIANS CAPTURED DURING THE DRIVE IN EAST PRUSSIA

Although the Russian campaign of 1914 was highly effective in the Balkan sector, the Germans gained a series of smashing victories in East Prussia. German forces routed the Russians in both the Battles of Tannenberg and Masurian Lakes, inflicting more than 1,000,000 casualties

mission was received. After two days of negotiations the Armistice was signed, and on Nov. 11, at 11 A.M. the war on the Western Front (and virtually everywhere else) was ended.

THE EASTERN FRONT

The entire German campaign, as explained earlier, was one of over-all strategy. The Schlieffen Plan, although first directed at the Western Front, had its counterpart on the Eastern Front. The last great German offensive never would have been possible had it not been for the conclusion of the war with Russia earlier in 1918 (March).

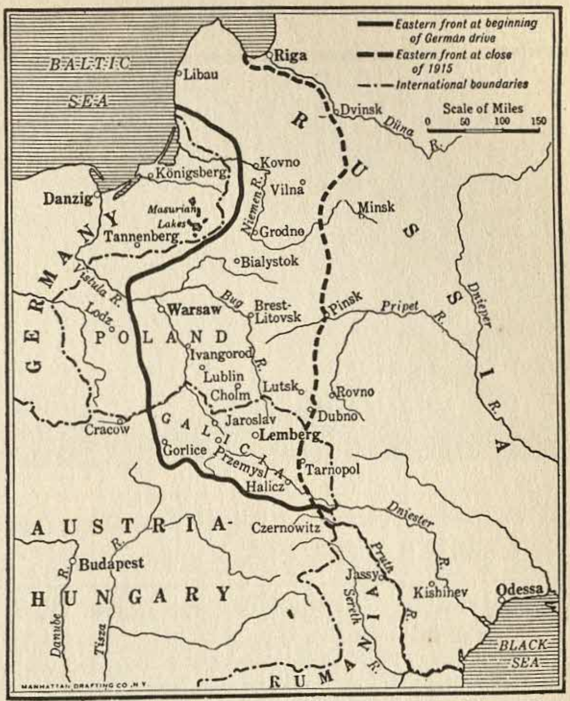
Complete success of the Schlieffen Plan required that the Germans maintain, as a minimum, a delaying action along the Eastern frontier. The Germans in East Prussia accomplished more than this, however; first in the Battle of Tannenberg (Aug. 26-31) and then in the Battle of Masurian Lakes (Sept. 4-10) they completely put an end to any possible Russian threats in that sector. But it must be pointed out that, in order to accomplish this, the Germans had drawn upon forces originally intended for use on the Western Front and had therefore so greatly weakened the forces in the Marne area that the aim of the Schlieffen Plan—to capture Paris—was not accomplished.

Against the Austrians, however, the Russians gained a series of stunning victories. On Sept. 3, the Russians captured Lemberg and, on Sept. 24, they laid siege to the great Austrian fortress of Przemysl. In the course of eight weeks of continuous fighting the Austrians lost Galicia, one of the most fertile of all Austro-Hungarian provinces, and some 350,000 troops.

The first two months of war on the Eastern front, therefore, had brought Russia great defeats and great victories; but the defeats far outweighed the victories. Russia had suffered more than 1,000,000 casualties in East Prussia, and by October 1914 the Russian people were already tired of the war. The Germans, on the other hand, were elated over their smashing victories in East Prussia. The Battles of Tannenberg and Masurian Lakes were national triumphs and Hindenburg, who had come out of retirement to lead the campaigns, and Ludendorff, who was the actual strategist and deserves the real credit for the victories, were celebrated as heroes.

By the end of 1914 the Russian campaign was at a standstill, and in 1915 the Germans took up the offensive on the Eastern Front. The four Russian armies which, a year earlier, had fought their way into Galicia were threatened with dismemberment, and by June 1915 the great Russian retirement was under way. In that month both Lemberg and Przemysl were recaptured from the Russians. In July, Hindenburg and Ludendorff struck across the Narew River in Poland, with fighting becoming general along the entire 800 m. of the Eastern Front from Memel to Czernowitz. Warsaw, Bialystok, Kovno, Grodno, and Brest-Litovsk fell in August. Vilna fell in September, and for a while it seemed that Petrograd (Leningrad) was in danger. Winter finally halted the German march; but by that time Russia had lost 15 per cent of her territory, 10 per cent of her railways, and—most important—30 per cent of her industries. Casualties were estimated at 2,500,000 killed, wounded or captured.

By the end of 1916 Russia was at the point of collapse; during that year she had experienced acute food, fuel, transport, and labor crises. By March 1917, the Russian Revolution was under way (see *Russia*) and Germany was doing all in her power to foment the mounting political unrest. Leon Trotsky (*q.v.*), the head of the Petrograd Soviet, opened the "peace offensive" on Nov. 21, 1917, with a message to all the belligerents inviting them to conclude an immediate armistice. The Western Allies refused, but, on Nov. 27, three Russian envoys under a white flag crossed the German lines to draw up the armistice terms. On Dec. 5, the armistice was signed, and, on Mar. 3, 1918, it was consolidated into the crushing Treaty of Brest-Litovsk. The signing of this treaty enabled Germany to turn her full military might against the Western Front. At the same time the treaty, by its sheer oppressiveness and harshness, served as a model for the Allies when the tables were later turned (see Armistice and Peace Treaties, later in this account).



From "Europe Since 1914" by F. L. Benns; published by F. S. Crofts & Co., Inc.

THE EASTERN FRONT IN 1915

According to the Treaty of Brest-Litovsk the Russians signed away the territories of Lithuania, Courland, and Poland (which had been set up by the Central Powers as a constitutional monarchy in 1916), and agreed to evacuate Livonia, Estonia, Finland, and the Ukraine. At the same time Turkey received Kars, Ardaham, and Batum. This treaty has since come to be known as the "forgotten treaty," as its entire contents were renounced by Germany after her defeat in November 1918.

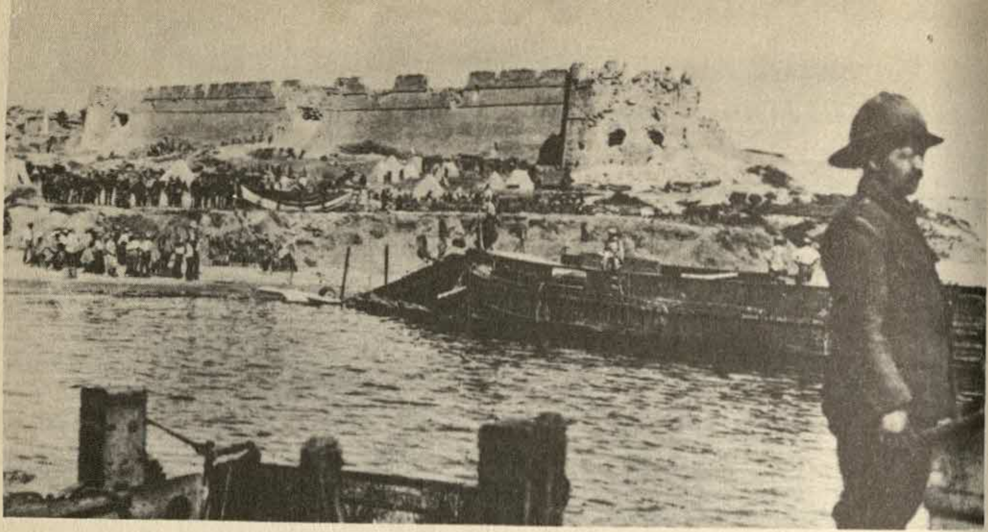
The Southern and Balkan Fronts

As the Central Powers had long planned their attacks against France and Russia, so had they carefully planned their campaign in the Balkans. Italy, already allied with Germany and Austria-Hungary in a Triple Alliance (*q.v.*), was expected to join the conflict on the side of the Central Powers. Thus Italy and Austria-Hungary would be completely able to end any possible resistance offered by the Balkan states. Italy, however, did not join the Central Powers. Claiming that she was bound only to join them in a defensive war (which, she said, this was not) she remained neutral for more than a year. In May 1915 she did join the conflict, however, but on the side of the Allies.

Assigned to face Serbia alone, Austria-Hungary immediately attempted to invade the little country. The Serbian defenders, stiffened by a strong nationalistic pride, met and repulsed the invaders in August 1914. Again in the following month Austria-Hungary attempted an invasion of Serbia, but this time a major portion of their attacking forces was diverted to stem the Russian advances in Galicia, and once again the invasion failed. Finally, on Dec. 2, the Austro-Hungarian forces managed to capture Belgrade, but within a matter of weeks they were once again driven out of Serbia. Thus, by Christmas 1914 Serbia had thrice been invaded, but each time the invaders had been completely repulsed.

The Italian refusal to join the Central Powers offered new hope to the Allies—if Italy could be persuaded to side with the Allies a new avenue of attack might be started in the south. For eight months Italy tried hard bargaining. Representatives of the Allies and the Central Powers met with Italian officials, each party offering Italy promises of special rewards if she would join their side. Finally the so-called Secret Treaty of London was signed on Apr. 26, 1915. Italy was promised that (upon the successful conclusion of hostilities) in return for joining the Allied cause she would receive Trentino and the Southern Tyrol, as well as other sectors. On May 23, 1915, Italy declared war against Austria-Hungary and on Aug. 27, 1916, against Germany.

Thus the Southern Front took on a new pattern. By midsummer 1915 Serbia was still hold-



Courtesy Brown Bros., N. Y.

DURING THE GALLIPOLI CAMPAIGN, 1915

The battered remnants of the fort guarding the Dardanelles after a Franco-British landing assault was defeated

ing her own, Italy had joined the Allies against Austria-Hungary, and the Allies were beginning a new offensive in the Dardanelles where Turkey had sided with the Central Powers in November 1914 (see Turkey, Palestine, and Colonial Operations, later in this account). Bulgaria, who had hoped to avoid the conflict, found herself in the midst of a new area of battle. To the west lay Serbia and Italy and to the east Turkey. Finally, in September 1915, Bulgaria concluded treaties with Germany, Austria-Hungary, and Turkey, and in October she declared war against Serbia.

The stage was once again set for an invasion of Serbia—this time to link up the Continent from Berlin to Bagdad. The first clash occurred on Oct. 7, with the Austrians occupying Belgrade three days later. By the end of the month the Serbian army was in full retreat and by early November the railway from Belgrade to Sofia, capital of Bulgaria, was freed. Thus the Central Powers had made contact with their Turkish ally, and the strategic end of the campaign had been achieved.

In the meantime the Allies were faced with the problem of Greece. Trusting that she would abide by the Greco-Serbian Alliance and aid Serbia, the Allies made no plans until September 1915. As soon as Bulgaria actually mobilized Greece did likewise, and the Greek premier, Eleutherios Venizelos, asked the Allies to send a force of 150,000 to aid the Greeks in support of Serbia. King Constantine, however, decided that the interests of Greece could best be served through neutrality; Venizelos was dismissed and the Greek promise to enter hostilities retracted. However, Allied forces were landed at Salonika; but they proved too few to aid Serbia and remained isolated at Salonika (but not interned).

Despite intermittent fighting in the Balkan area during 1916 the next major event in the over-all campaign was the entrance of Rumania into the hostilities on the side of the Allies on Aug. 27, 1916. During the first three weeks of her campaign Rumania conquered about one-quarter of Transylvania, a Hungarian province, only to be driven back by the end of September. By the middle of October, the invasion of Rumania by the Central Powers was under way; on Oct. 22, Constanza fell, and on Dec. 6, Bucharest, capital of Rumania, fell. By January 1917, the Central Powers had occupied all of Dobrudja, all Wallachia, and a part of Southern Moldavia, all provinces of Rumania.

For a year and a half the Allied forces had been practically impotent in their isolated stand at Salonika. Finally, in July 1917, the Allies succeeded in persuading Greece to join their side, thereby enabling the Allied troops at Salonika to take action in the hostilities. But, by this time, war-weariness was beginning to take its toll on both sides, as it had on the Western and Eastern Fronts, and operations slowed down to an almost complete standstill.

The only considerable offensive essayed by the Central Powers in the south during 1917 was the Battle of Caporetto, or the Twelfth Battle of the Isonzo, as it was called in Italy. Caporetto was planned in complete secrecy. Six German and nine Austrian divisions were deployed for the attack, with two Austrian armies being held in reserve. The assault on Caporetto began on the morning of Oct. 24, lasting until mid-November. During its course Italy lost 6,000 sq. m. of territory and some 600,000 men.

The first of the southern powers to capitulate was Rumania, who, on March 7, 1918, signed the Treaty of Bucharest with Germany. The war for Rumania had been comparatively quick and very hard; she had made no permanent gains and had only suffered tremendous losses. She was only too willing to withdraw, even at the expense of a harsh treaty. (This treaty, like the Treaty of Brest-Litovsk, however, was abrogated by the

From Illustrated London News

THE WAR IN THE DESERT, 1917

terms of the Armistice Germany signed in 1918.)

Soon, in turn, Bulgaria was the first of the Central Powers to forsake the fight. Despite the inactivity along her frontiers during the final stages of the war, her troops had become completely demoralized. They had been under arms, intermittently, for more than six years, taking part in the Balkan Wars of 1912 and 1913 as well as the present conflict. One-quarter of the male population had been called up for the army; women and children could not maintain the national economy; and, perhaps worst of all, recent harvests had been small. As a result, on Sept. 29, 1918, the Allies signed an armistice with Bulgaria.

Even as Bulgaria was seeking an armistice and as the Allies, in the West, were rolling towards Germany, Italy was assuming the offensive in the south. On Oct. 24, 1918, the anniversary of Caporetto, Italy began a new campaign south of the Venetian Alps. Within a matter of days she had pushed the weary Austro-Hungarian invaders north and almost completely out of Italy. The Italian armies were gaining as they never had before. On Oct. 30, an Austro-Hungarian delegation appealed for an armistice, and, on Nov. 3, an armistice commission accepted the armistice terms laid down by the Italian commander, Gen. Pietro Badoglio (*q.v.*). Three days later a separate armistice was concluded with Hungary and revolution overtook Austria-Hungary. Already the Dual Monarchy had been ended. Austria, Hungary, Czechoslovakia, and Poland had declared their independence. On Nov. 11, 1918, Emperor Charles abdicated and the 300-year-old Hapsburg dynasty terminated, as it had started, out of bloodshed.

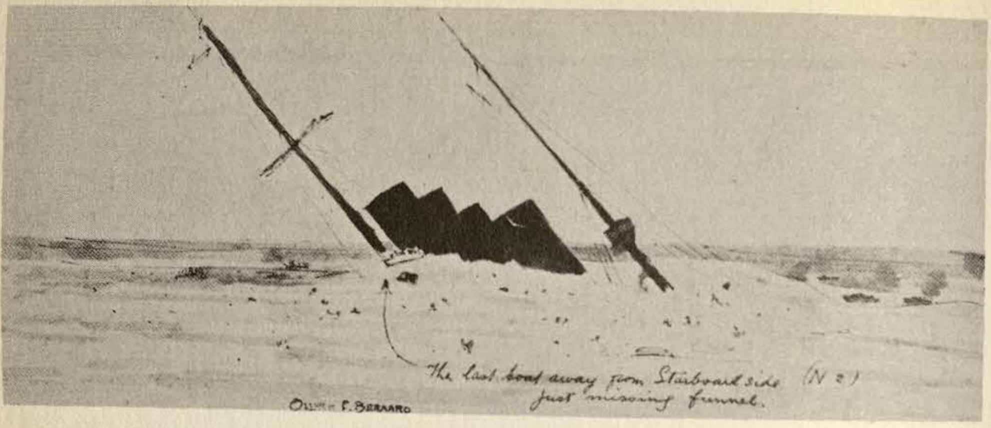
OPERATIONS IN TURKEY, PALESTINE, AND THE COLONIES

Despite the fact that most of the major campaigns of the war centered in Europe, much important action took place in Turkey, Palestine, and throughout the colonial empire of Germany. The series of Allied victories in these areas enabled the Allies to localize the conflict and interrupt the Central Powers' lines of supply.

As soon as war had been declared British and French contingents began setting about the task of capturing the various German possessions throughout the world. In August and September 1914, Samoa fell to New Zealand; New Guinea and the Bismarck Archipelago fell to Australia; Togoland was occupied by Anglo-French forces; and Germans and Portuguese were fighting in Angola. On Sept. 2, 1914, the Japanese (who had joined the conflict on Aug. 23, 1914) landed at Shantung and reduced the German port of Tsingtao after a hard-fought campaign of two months' duration. In November, the Japanese occupied the German islands in the North Pacific, and by the end of 1914 only the Western Hemisphere was devoid of military operations.

In the meantime, Turkey, who had long been a subject of much attention by the German Empire, joined the Central Powers, ordering general mobilization in late August 1914. The first action between the Turkish and Russian fleets occurred on Oct. 29, 1914. On Nov. 3, an Allied squadron bombarded the outer forts of the Dardanelles; on Nov. 4, Russia, and on Nov. 5, Britain and France, declared war on Turkey. On Nov. 1, Britain declared martial law in Egypt, and, on Nov. 3, she annexed Cyprus, then nominally a part of Turkey. On Nov. 6, a British force landed in Mesopotamia. By mid-November, the Sultan solemnly proclaimed a Holy War and called upon the "faithful" Moslems to rise up against the "infidel" oppressors.

The first major battle in the Near East did not occur until the Spring of 1915. At that time a combined British and French force tried, unsuccessfully, to open the Dardanelles. Attempting this first by sea and then by land at Gallipoli, both attacks were beaten off by the Turkish defenders. The failure of the Allied attacks at the Dardanelles convinced the British leaders that a new avenue of approach was needed. As a result a


The last boat away from Starboard side (N 2)
just missing funnel.
OLIVER F. BERNARD

From Illustrated London News

SINKING OF THE LUSITANIA

Probably no other German act aroused more indignation among Americans than the sinking of the liner *Lusitania* by a German submarine in May 1915, killing 1,154 persons among whom were 114 Americans

new British offensive was opened in Mesopotamia (where the British had earlier been driven back) and, by March 1917, British and Turkish forces were once again joining battle.

Aided by an Arab army which had revolted from the rule of the Sultan, the British, under Gen. Allenby, met and drove back the Turkish armies. Jerusalem was captured in December 1917. By 1918 the Turkish forces were confined to Asia Minor. The collapse of Bulgaria in September 1918 isolated Turkey, forcing her to sign an armistice in October 1918. The withdrawal of Bulgaria and Turkey opened the way for Allies to drive on the Central Powers from the southeast—a factor which played no small part in the subsequent German collapse.

Naval Operations

The war at sea was a major factor in the entire course of World War I, and as such its importance must not be minimized. Ever since the late 1890's Germany and England had been bitter naval rivals, and, in 1914, both their fleets were the mightiest then known. At the outset of the conflict, however, Britain held a large margin over the navy of Germany (the total tonnage of Great Britain was 2,714,106 tons, while the tonnage of Germany was 1,306,577).

Already assembled before the outbreak of hostilities, the British fleet immediately assumed control of the seas once war was declared. A blockade of the Central Powers was imposed which surpassed any ever before known; all enemy shipping was curtailed, and it became almost impossible for them to send any commodities across the Atlantic. During the first two months of the war, alone, 10 per cent of the Austrian and German merchant ships were sunk while at sea, and it became increasingly difficult to transport even such vital necessities as food or medicine.

Despite the effectiveness of the Allied blockade there were several engagements during the course of the war; some involved only a handful of ships, but some involved almost entire fleets.

Among the minor engagements were the actions on Sept. 22, 1914, when a single German submarine destroyed three British destroyers, and on Dec. 8, 1914, when two German destroyers, the *Scharnhorst* and the *Gneisenau,* were trapped and destroyed off the Falkland Islands. To the list of major engagements belong the battle in the Bight of Helgoland, on Aug. 28, 1914, when the English and the German fleets fought to a standstill; and the major naval engagement of the entire war, the Battle of Jutland (May 1916). Resulting in large losses for both sides, Jutland marked the end of large-scale naval engagements during the war; the gains, if any, were by far outweighed by the losses. (The British losses were three battle cruisers, three armored cruisers, eight destroyers, and 6,097 officers and men killed; the German losses were one battleship, one battle cruiser, four light cruisers, five destroyers, and 2,545 officers and men killed.)

Germany entered 1917 badly shaken, both on the land and sea. Her decision, as we noted before, to adopt "unrestricted" submarine warfare resulted in the entry of the U.S. into the war, and although for a while it appeared that Germany might dominate the seas, her supremacy was short-lived. The tremendous increase in American ship production, the development of the convoy system and the submarine patrol, or so-called Q-ships, all combined to counteract completely the submarine campaign. During the entire war German submarines succeeded in torpedoing only five U.S. Army transports; three were sunk, and two returned to their home ports in a damaged condition. All five, however, were on return voyages to the U.S. when struck, and were therefore carrying no troops. The Germans had played their trump card by invoking the unrestricted submarine campaign; the Allies, by drawing upon their tremendous resources, had managed to overtrump.

One last effort was planned by the German fleet just a few days prior to the signing of the 1918 Armistice. This endeavor completely failed, however, when the members of the fleet refused to sail against the enemy.

According to the terms of the Compiègne Armistice the entire German fleet was to be surrendered to the Allies; however, in June 1919, the night before the fleet was due to be delivered to the Allies, a majority of the fleet was scuttled by German sailors at Scapa Flow.

THE ARMISTICE AND THE PEACE TREATIES

With the conclusion of the war, the bloodiest and costliest ever fought, the Powers were ready to write the peace treaties. Sixty-five million men had been mobilized for battle; 9,000,000 had been killed in action; and 22,000,000 had been wounded. The total direct war costs for all the belligerents amounted to almost $186,000,000,000; the indirect costs such as destruction of property, depreciation of capital, loss of production, interruption of trade, etc., amounted to an additional $90,000,000,000. It is estimated that the war actually decreased the national wealth of Great Britain 12.7 per cent, of France 25 per cent, of Italy 20 per cent, and of Germany 26 per cent; at the same time it made the U.S. the financially strongest power.

By the terms of the Nov. 11 Compiègne Armistice Germany agreed to the evacuation of all territories invaded by her armies as well as Alsace-Lorraine (*q.v.*); to the evacuation of the left bank of the Rhine and of the three bridgeheads at Mainz, Coblenz, and Cologne; to the Allied occupation of this area and to the support of the Allied Army of Occupation; to the establishment of a neutral zone 10 kilometers wide along the right bank of the Rhine; to the surrender of 5,000 guns, 25,000 machine guns, 3,000 motors, 1,700 airplanes, 5,000 locomotives, 150,000 wagons, 5,000 lorries, all its submarines, 6 battle cruisers, 10 battleships, 8 light cruisers, and 50 destroyers; to the restoration of all gold deposits removed from Belgium, Russia, and Rumania; to the repatriation of all inhabitants from evacuated territories; to the repatriation of all Allied prisoners of war without reciprocity (although all prisoners held by the Central Powers were quickly repatriated, the Allies did not complete the repatriation of their prisoners until several years later); and to the annulment of the Treaties of Brest-Litovsk (with Russia) and Bucharest (with Rumania). The Allied blockade was also maintained until the signing of the peace treaty.

Two months after the signing of the Armistice, the victorious powers opened the peace conference in Paris, calling the first plenary session on Jan. 18, 1919. Woodrow Wilson, Robert Lansing, and Col. House represented the U.S.; David Lloyd George and Arthur Balfour, Great Britain; Georges Clemenceau and Ferdinand Foch, France; Jan Smuts, South Africa; Vittorio Orlando, Italy; and Eleutherios Venizelos, Greece (*qq.v.*). The real leadership, however, was vested in the so-called Big Four—Wilson, Clemenceau, Lloyd George, and Orlando.

Although the Powers had united to defeat their enemy, they were far from united on the peace they hoped to gain. As early as January 1918 Wilson had indicated that he wanted to see the peace based on his so-called "Fourteen Points" (*q.v.*). While some of these points coincided with the special aims of the Allies, the spirit of Wilson's program was quite contradictory to such agreements as the Secret Treaty of London. Nevertheless, most of the Fourteen Points were accepted by the Allies (with certain reservations) as the basis of the peace.

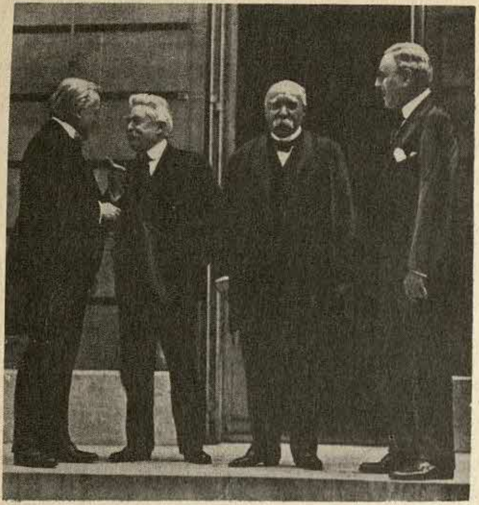
The Treaty of Versailles was signed on June 28, 1919, in the palace of Versailles, where 48 years before the German Empire had been proclaimed. Before listing the terms it should be pointed out that Germany laid down arms under the condition that the Fourteen Points as already modified would be the basis for peace. The fact that this was not the case, plus the fact that the German militarists later falsely claimed the conduct of the war was taken away from them by nonmilitarist government officials, were both later used by Germany, especially under Adolf Hitler (*q.v.*), as reasons why she should not abide by the terms of the Treaty of Versailles.

The general provisions of the Treaty are as follows:

The treaty included two special features: A "war guilt" clause in which Germany admitted that she and her allies were responsible for all damage to the civilian population of the Allied countries as a result of the war which they had launched against the Allies (a clause which was later to prove most repugnant to Germany); and the Covenant of the League of Nations (*q.v.*). Incidentally, it was the inclusion of this covenant and refusal of the U.S. to join the League without reservations which later caused the U.S. to reject the treaty. The U.S. and Germany, however, did conclude a separate peace treaty which was ratified in 1921.

Other provisions of the treaty are as follows:

Territorial Provisions: (1) Alsace-Lorraine ceded to France; (2) Posen and a corridor about 60 m. wide separating Pomerania from East Prussia ceded to Poland; (3) Small districts, including the towns of Eupen, Malmedy, and Moresnet, ceded to Belgium; (4) Danzig and the surrounding territory (about 700 sq. m.) separated from



From Illustrated London News

THE BIG FOUR AT VERSAILLES

(*From left to right*) Lloyd George, Orlando, Clemenceau, and Wilson

Germany and organized as a Free City under the League; (5) Memel and a strip of territory northeast of the Memel River ceded to the Allies (turned over to Lithuania in 1924); (6) Plebiscites to be held in Schleswig, Upper Silesia, and certain districts in East Prussia (in 1920 the Schleswig plebiscite determined that Northern Schleswig should go to Denmark and Southern Schleswig to Germany; a plebiscite held in Upper Silesia in the same year resulted in a majority voting in favor of Germany; however, the Poles within the region objected and a League of Nations Commission later determined that the area should be divided between Poland and Germany roughly according to the votes); (7) The surrender of all German overseas possessions to the League.

Miscellaneous Economic and Territorial Provisions: (1) The coal mines of the Saar Basin ceded to France with the privilege of re-purchase by Germany after 15 years if the population voted to return to Germany (the territory was administered by the League until 1935 when a plebiscite decided the return of the territory to Germany); (2) The loss of all commercial concessions and economic spheres of influence in China, Siam, Liberia, Egypt, Morocco, and other regions; (3) Luxemburg was severed from the German Customs Union and united economically with Belgium.

Military and Naval Provisions: (1) Germany's army was limited to a maximum of 100,000 men; (2) Conscription was abolished, and voluntary enlistments were permitted for a 12-year period for private soldiers and a 25-year period for officers (to prevent the building of a trained reserve by the rotation of service); (3) The navy was to be reduced to a skeleton patrol with tonnage of ships severely limited and submarines entirely prohibited; (4) The entire area west of the Rhine and a zone 50 kilometers deep east of the Rhine was to be demilitarized forever; (5) The manufacture of arms was to be supervised by an Allied commission, and the manufacture of all heavy armaments—tanks, bombing planes, and large-caliber artillery—was prohibited; (6) Naval fortifications at Helgoland were to be destroyed and the Kiel Canal was to be demilitarized. (At the same time it was agreed that the League would later adopt arms limitation agreements, although this pact was not included in the treaty.)

Reparations: Germany was to surrender her entire merchant marine in return for having sunk so many Allied merchant ships; large quantities of livestock, raw materials, coal, and chemicals (in return for the untold hardships caused to French and Belgian citizens and homes); and $5,000,000,000 before May 21, 1921. (See also *Reparations.*)

Summary: The losses inflicted upon the German economy by the treaty may be summarized as follows: She lost (1) one-eighth of her area and one-tenth of her population; (2) two-thirds of her iron ore, half of her coal, three-fourths of her zinc ore, half of her lead ore, and nearly all her potash; (3) practically all her foreign investments, amounting to one-tenth of her total wealth; (4) one-sixth of her agricultural produce, and one-tenth of her manufacturing plants.

SIGNING THE AUSTRIAN PEACE TREATY

Austrian Chancellor Renner on his way to the ceremony which formally ended World War I. Although Renner was deprived of any official position during the Nazi domination of Austria, his country called on him to sign the Austrian surrender document at the end of World World II

Other peace treaties concluded after the war:

Treaty of St. Germain (Sept. 1919): This treaty with Austria was similar to the Treaty of Versailles. It provided that: (1) The Republic of Austria accepted partial guilt for the war and hence liability for reparations; (2) No union was to be permitted between Austria and Germany without the consent of the League; (3) The Austrian army was to be reduced to 30,000; (4) Her navy was to be restricted to three police boats on the Danube; (5) Austria was to recognize the independence of Hungary, Czechoslovakia, Poland, and Yugoslavia.

Treaty of Neuilly (Nov. 1919): This treaty with Bulgaria provided that Rumania should get Dobruja; Yugoslavia most of Macedonia; and Greece Western Thrace and the Aegean coast. Bulgaria's army was to be reduced to 20,000 men, and her navy was to be practically abolished. She was also made liable for reparations. (The main provisions of this treaty, however, simply restated the terms of the Treaty of Bucharest, concluded in 1913 at the end of the Balkan War.)

Treaty of Trianon (June 1920): According to this treaty with Hungary she gave up the Slovak provinces to Czechoslovakia; Croatia to Yugoslavia; Transylvania to Rumania; and the Banat to Yugoslavia and Rumania.

Treaty of Sèvres (Aug. 1920): This treaty with Turkey provided that (1) Turkey give up Arabia, Palestine, Mesopotamia, and Syria, at the same time retaining Constantinople and Eastern Thrace; (2) Palestine, Mesopotamia, and the Jordan territory would become mandates of Great Britain; (3) Syria would be a French mandate; (4) Spheres of influence would be given to France in Cilicia and to Italy in Anatolia; (5) Greece would obtain Thrace, Adrianople, Gallipoli, and the islands of Imbros and Tenedos, and the Dodecanese Islands which Italy had occupied; (6) The Dardanelles would be internationalized. The treaty was never ratified, however, and the final settlement with Turkey was made in the Treaty of Lausanne (*q.v.*) in 1923.

For further information on World War I see also the articles on individual nations and persons involved; *League of Nations; Locarno Treaties; Montreux Convention;* etc.

World War II, a conflict between the Axis Powers (Germany, Italy, and Japan) and the Allies, later the United Nations (principally France, Great Britain, the U.S.S.R., and the U.S.). Lasting from September 1939 to September 1945, it involved or affected most of the nations of the world, with actual fighting ranging from northernmost Norway and Finland to the remote islands of the South Pacific.

FUNDAMENTAL CAUSES

In the "long armistice" between World War I and World War II, especially during the world depression of the 1930's, economic competition among nations was at a high peak. Some countries considered themselves "have-not" nations, needing more "living space" in terms of raw materials and markets. Others, the "have" nations, showed no desire to share their wealth. Both groups wanted more.

At the same time these competing nations represented various political philosophies, namely, Democracy, Communism, and Fascism (including Nazism). Each of these three major ideological groups had evolved definite theories of economic and political action and each was an enemy of the other two.

Because competing nationalism was an important element of each of these conflicting ideologies, the 1930's produced three sets of prospective belligerents. The democratic bloc was opposed to the Communist and Fascist powers because they were totalitarian tyrannies, admittedly bent upon expansion at any price. The dictators resented the relative prosperity of the democratic powers and argued that prosperity had made them "decadent" and not worthy of survival; they sneered at democratic idealism, with its emphasis on representative government and the rights of the individual.

The Totalitarians. Russia, since 1923 the Union of Soviet Socialist Republics (*q.v.*), had for generations been marked by an expanding nationalism. While trying to make the difficult transition from an agrarian to an industrial economy, she was also, under the Marxist leaders Nikolai Lenin, Leon Trotsky, and Joseph Stalin (*qq.v.*), fired by a crusading urge to bring about the "World Revolution." Should this take place, Moscow would become the capital of the Communist International, with all other nations becoming Soviet satellites.

Italy (*q.v.*), which had not profited greatly by World War I, early developed political and labor problems which paved the way for a dictator, Benito Mussolini (*q.v.*), who rose to power in 1922 on a platform of nationalism and anti-Communism. The Italians were still proud that Rome had once ruled the Mediterranean world. Mussolini took for his party's symbol the fasces, the mark of the Pax Romana (*q.v.*), to indicate the unity of all the elements of the nation under his "corporate state" and to indicate his intention of making Italy once more a great power. He talked about *Mare Nostrum*—"our sea"—and about his plans for controlling the Mediterranean area. As Italy was neither politically nor industrially very powerful, the rest of the world dismissed such talk as mere bluster—until several more countries of Europe began to feel totalitarian pressures.

Germany (*q.v.*), from the mid-1920's onward, began to recover rapidly from her defeat in

World War I. Her powerful nationalist faction vowed to take back all that Germany had lost through the Versailles Treaty (*q.v.*) and to acquire more "living space" as well. The middle class was restless because of its suffering during the postwar inflation. Labor leaders, industrialists, and the aristocratic military caste became increasingly alarmed at the growing menace of Soviet Communism. Many Germans, influenced by the romantic nationalism of the 19th century as well as by the economic nationalism of the 20th century, were dreaming of uniting all German-speaking peoples and of subjecting others, especially those to the east, to the dictates of the "master race." Germany was ripe for reaction; only a leader was needed. Adolf Hitler (*q.v.*) emerged as that leader.

Hitler, methodically and with surprising speed, built a labor-socialist organization as the nucleus of German Fascism (the shortened name *Nazi* came from "National Socialism"). The organization was, however, neither the nucleus of a labor nor of a Socialist or Christian-Socialist movement; it was actually a corporate state, considerably strengthened over the model provided by Mussolini. By intimidation and by physical force applied by his brown-shirted Storm Troopers and Elite Guards, he came to power in 1933 and created a totalitarian police state. The German people, eager for prosperity and renewed national greatness, followed Hitler enthusiastically; dissenting minority groups were ruthlessly repressed. In defiance of the Versailles Treaty, Hitler reinstituted conscription in 1934 and worked feverishly to rearm Germany. See also *World War I:* THE ARMISTICE AND THE PEACE TREATIES.

The Democracies. Besides the big three "have" nations—the U.S., Great Britain, and France—there were some 40 other countries which were ruled on more or less democratic principles. Although these nations also were intensely nationalistic, most of them were too small or too remote to concern themselves forcefully with international affairs. The democratic states had, to be sure, created the League of Nations (*q.v.*) to safeguard their common interests; but nationalism was so powerful a force that the various member nations refused to give the organization any real power, and the U.S. declined even to join it. With no police power to punish aggression, the League remained just one of many efforts to bring about collective security. Other such efforts included a series of loose alliances and agreements such as the Little Entente, the Locarno Treaties (*qq.v.*), and the Kellogg-Briand Peace Pact. Through the 1920's and '30's there were various conferences on reduction of armaments and on economic problems. There were finally bilateral agreements, or mutual-assistance pacts, between pairs of nations. Communist Russia entered a mutual-assistance pact with France; and another treaty, also signed in 1935, stated that Soviet Russia would come to the aid of Czechoslovakia in case of an unprovoked attack, provided France would do likewise.

Meanwhile, the status of the smaller nations of Eastern Europe was somewhat precarious. The World War I settlements had left some, notably Austria, Hungary, and Bulgaria, restricted in both area and markets; historical as well as economic arguments tended to force them into the totalitarian orbit. Others, *i.e.,* the new democracies set up by the idealistic attempt to permit "self-determination" for racial groups—*e.g.,* Poland, Czechoslovakia, Latvia, Lithuania, Finland—were in fact buffer states, indefensible against German aggression unless a democratic-minded Russia should align herself (as in 1914) with the Western Powers. Russia made periodic attempts to set up a "collective security" system, but Soviet motives were suspect in the West and these ventures produced no real advantage.

THE PATTERN OF AGGRESSION

Japan. While the next war was thus shaping up in Europe, a pattern of action for the "have-not" nations was being drawn up in the Far East. Japan (*q.v.*), which had benefited greatly from the Russo-Japanese War and from her not-too-strenuous part in World War I, had become a highly industrialized nation with the same raw-material and market problems that beset Italy and Germany. For essentially similar reasons, she fell under the sway of a military oligarchy with strong Fascist characteristics. The first overt step was taken in November 1931, when Japanese generals in Manchuria, largely on their own initiative, established the puppet state of Manchukuo (*q.v.*). Henry L. Stimson, as U.S. Secretary of State, suggested that prompt action by the democracies might stop this aggression against China and forestall further moves, but other nations apparently felt that the issue was a minor one. China (*q.v.*) appealed to the League of Nations; the League passed a vote of censure against Japan (June 1933), whereupon Japan promptly withdrew from the League and sent more troops into Manchuria to reinforce her hold. She fought a small but vigorous undeclared war with the U.S.S.R. along the Mongolian borders in 1935, built an army of some 750,000 men, and began a tremendous program of naval expansion. In 1936, when an election showed a public tendency to slow down this warlike process, the militarists assassinated their chief opponents, clamped down tighter controls on the populace, and stepped up their armament program. In July 1937 the Japanese began a full-scale invasion of China proper: for the next eight years they kept the still-fighting

Chinese government far inland and effectively controlled the Chinese coast.

Italy. Ever since her unification in 1870, Italy had been trying to emulate the other Western nations and build an empire in Africa. Independent Ethiopia (*q.v.*), unclaimed by other powers, seemed the likeliest victim; but twice Italian armies were roundly beaten by the Ethiopians, and Italy duly signed territorial agreements and treaties of friendship. In 1935, however, Mussolini, watching the unopposed Japanese success in Manchuria, struck at the Ethiopians with machine guns, poison gas, and air power. The League of Nations declared Italy an aggressor and voted to impose "sanctions" (economic boycotts) on her but the member nations did not enforce the sanctions. Ethiopia fell and was annexed to Italy. Emperor Haile Selassie (*q.v.*) escaped and was still paying his nation's membership dues to the embarrassed League when World War II broke out.

Spain. In July 1936, Spain (*q.v.*) was torn by a Fascist-inspired civil war, a revolt of a reactionary military clique against the republican government which had been established in 1931. Before the civil strife was over in 1939, Mussolini and Hitler, who had previously formed the Rome-Berlin Axis, both sent large contingents of troops and planes to the assistance of the Falangist (Fascist) armies of Gen. Francisco Franco (*q.v.*). The Loyalist government appealed to the rest of the world for help, but the general atmosphere was one of neutralism. The U.S.S.R. responded, as did impassioned bodies of Socialist-minded volunteers from various nations. The Russian aid further convinced the other nations that the Loyalist government was "red" and gave them further justification for keeping hands off. Franco, who could not have won without the generous aid of the Axis Powers, triumphed in 1939 and set up a rigidly Fascist government. This "preview" war was doubly significant: it gave the warlike nations a chance to test post-World War I weapons under war conditions and, even more important, convinced them that the democracies were really "decadent" and would not fight even under provocation.

Aggression and Appeasement. If Japan and Italy could successfully defy the League of Nations, if Great Britain and France could not decide upon joint action, and if the U.S. (not even a League member) was playing a strictly "hands-off" game, the time might have come, Hitler decided, for Germany to act. To be sure, France and the Soviet Union had entered into a mutual-assistance pact in May 1935, but France had assured Hitler that it was a purely defensive alliance and even invited Germany to join it. England, with a suspicious eye on the U.S.S.R., had assured Hitler that Britain would have no part in encircling the Third Reich; further, in May 1935, without informing France, Britain had signed an agreement allowing Germany to build a navy up to 35 per cent of British naval strength, provided only that Germany build no submarines. See also *Appeasement Policy.*

Suddenly, then, on March 7, 1936—in flagrant violation of the Versailles and Locarno treaties, which Hitler seized the opportunity to denounce—German troops moved into the demilitarized Rhineland. It was a bold "bluff": Hitler was quite ready to withdraw the troops if either France or Britain should raise strong objections; but neither nation did so. Britain declined to back up France in any step she might take except a diplomatic note. The League of Nations declared Germany to be guilty of treaty violations but did not even impose sanctions. Hitler had always shown contempt for the League, from which he had withdrawn German membership as early as October 1933.

France, to whom an aggressive Germany loomed far larger than the Communist crusade for control by political infiltration, began to strengthen her large army and to provide for stationing it along a fortified line—the Maginot Line—running the length of her northern border (see *Fortifications*). Although the French worked diligently (and expensively) on their defense, they planned for World War II in terms of World War I stationary defenses. They also placed too much reliance on the impregnability of neighboring Belgium, which had been almost fatally overrun as recently as 1914. Meanwhile, Germany was using all her technical and military skill in building *Panzer* (mobile armored) units and tactical aircraft.

While collective security, or joint action to stop aggression, was breaking down among the democracies, the Rome-Berlin Axis (formed officially Oct. 25, 1936) was followed by a German-Japanese anti-Communist agreement (Nov. 17, 1936), later joined by Italy. Eventually (April 7, 1939), Gen. Franco's Spain joined Germany, Italy, and Japan in their joint Anti-Comintern Pact. In effect, this treaty was an Anti-Democracy pact.

When Hitler so successfully remilitarized the Rhineland, he frightened Austria (*q.v.*) into legalizing a Nazi party inside her borders. Finally, in March 1938, after threatening to bombard Vienna and to dispatch a German army of 200,000 men into Austria, he forced the resignation of Chancellor Kurt von Schuschnigg (*q.v.*), replaced him with a loyal Nazi gauleiter, and proclaimed that Austria was "once more" a part of Germany.

This action shocked the outside world, including Italy, thus suddenly made a neighbor of a stronger, aggressive nation; but Italy was now a partner in the Axis. France redoubled her efforts to complete the Maginot Line, and Britain began to strengthen her air force. While a few Americans contemplated revising the current Neutrality Act (see *Neutrality*), other nations, including the Soviet Union, had abandoned all thoughts of neutrality and were busily arming.

On the same day that German troops marched unopposed into Vienna, Hitler made a speech about "rescuing" the Sudeten Germans, who formed a strong and vociferous minority group within Czechoslovakia (*q.v.*). Two months later he mobilized his army preparatory to invading Czechoslovakia; the latter immediately ordered a countermobilization. Hitler hesitated. Would Russia and France really act now? And what of Britain? Hitler did not know; neither did Czechoslovakia. But the general tension of impending war was undisguisably present.

At this point, British Prime Minister Neville Chamberlain (*q.v.*) entered the picture. He extracted from Hitler a promise that Czechoslovakia would not be attacked if the Sudeten Germans were given self-determination. Hitler then promptly demanded that every minority in Czechoslovakia be given self-determination (thus breaking the nation into militarily indefensible fragments) and that German troops be given the task of enforcing the partition. Europe again stood on the brink of war. Chamberlain and the French premier, Édouard Daladier (*q.v.*), aided by Mussolini, persuaded Hitler to attend a four-power conference—without the participation of the Soviet Union (see *Munich Pact*).

At the Munich Conference (*q.v.*), on Sept. 29, 1938, Hitler declared that the Sudetenland was his only territorial claim, but that he meant to have that at any cost and would bomb London and Paris if the British and French should interfere. The myth of invincible German air power had been skillfully developed; the diplomats yielded. Czechoslovakia, the one truly democratic barrier state between the East and the West, was bartered away, without her consent, for a promise that proved to be worthless. Chamberlain returned to London waving a copy of the signed agreement, stating that it meant "peace for our time." (In any case, it meant peace for *a* time, during which Britain could arm for the now obviously unavoidable conflict.) France was pleased and optimistic when, on Dec. 8, 1938, the German foreign minister, Joachim von Ribbentrop, signed a bilateral Franco-German nonaggression treaty.

With the surrender of the Sudetenland to Hitler, the unification of the German-speaking peoples was now almost complete. Only in Danzig (*q.v.*), in part of the Polish Corridor, and in the Lithuanian port of Memel (*q.v.*) were there remaining large German populations. There were a few enclaves or pockets of Germans in the Balkans, but these could be picked up later. The German planners remembered the Kaiser's old Berlin-to-Bagdad railroad project and considered the wealth of the wheat-growing Ukraine. To be sure, any major eastward move would mean war with the Soviet Union; but there seemed good reasons to believe that no general conflagration would follow. France was concentrating on local defense behind the Maginot Line; Great Britain, with its influential "Cliveden set" of appeasers, might be relieved at seeing Communist Russia weakened, if not destroyed; and the isolationist U.S. was far away. None, Hitler felt, would face a major war for remote nations outside their own spheres of influence.

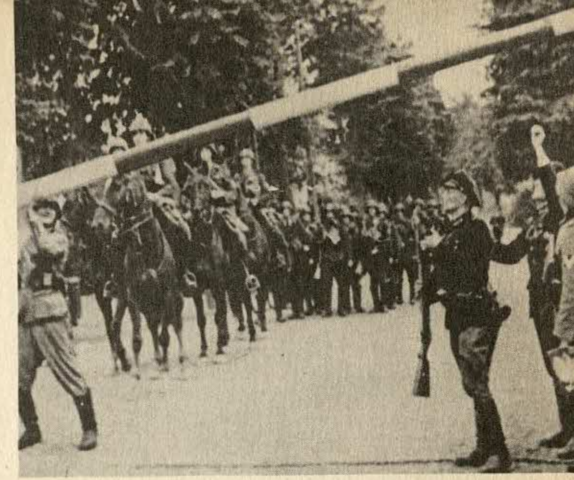
Suddenly, on March 15, 1939, Hitler proclaimed a protectorate over the whole of Czechoslovakia, declaring Slovakia (*q.v.*) a "free" nation. One week later (March 23) he seized Memel from Lithuania and began preparing to attack Poland (*q.v.*). Mussolini, thus far a bystander, decided that Italy might as well have some of these undefended territories, and on April 7, 1939, Italian forces, with little resistance, seized Albania (*q.v.*).

Seeing that appeasement merely seemed to whet the appetite of aggressor nations, Great Britain and France now saw fit to announce a joint policy. On March 31, Chamberlain declared that if Poland should resist attack, the British would lend "all support in their power." France immediately issued a similar statement.

The attitude of the U.S. was also undergoing a change. Isolationism, which had manifested itself in a failure to join the League of Nations and in the Neutrality Acts of 1935, 1936, and 1937, became the theme of a great debate. Rising moral indignation produced a growing inclination either to repeal the Neutrality Act or at least to revise it to permit the shipping of arms to countries fighting aggression. The "cash-and-carry" provisions of the Neutrality Act of 1937, which permitted the sale of nonmilitary items to belligerents if they could pay cash and provide their own transport for them, were revised in 1939 to permit the inclusion of armaments and munitions.

WORLD WAR II

Hitler, worried about whether the democracies would really fight, sought to avoid the type of two-front war which had defeated Germany in 1918. He made nonaggression pacts with Denmark, Estonia, and Latvia (*qq.v.*). Then, suddenly, the West was startled to learn that on Aug. 23, 1939, while French and British negotiators were in Moscow to conclude a mutual-defense treaty, Nazi Germany and Communist Russia—arch-enemies up to that moment—had signed a nonaggression pact. Later, it became known that their understanding involved a partition of the smaller eastern nations between them. This move has never been fully explained; but it may have been a Russian equivalent of the Munich Pact—a



International News Photo

GERMANY INVADES POLAND

Advance guards of the German cavalry raise the barrier at the German-Polish border, Sept. 1, 1939, in the earliest phase of World War II

desperate gamble for time to prepare against a foreseeable attack.

The war started on Sept. 1, 1939, as had been anticipated by Gen. Wilhelm Keitel (*q.v.*) in a secret directive to the armed forces issued on April 3. Hitler had made demands upon Poland which he knew would be refused; the Poles' pleas for time or consideration were refused. At dawn on a Friday—the totalitarians habitually moved on week-ends—German armored divisions and dive bombers went into furious action. London sent an ultimatum to Berlin: if the drive into Poland were not stopped by 11 A.M. on Sept. 3, Britain would be at war with Germany as of that hour. The drive did not stop, and at five o'clock France joined England in war against Germany.

The war thus unleashed eventually involved 184 belligerents, although there were only 153 formal declarations of war.

Lightning War. The first new word the outside world learned after hostilities opened in Poland was blitzkrieg, or "lightning war," a term accurately describing the tactics of the mechanized German war machine as it tore into Poland supported by 1,000 roaring dive bombers and more than 1,000 pursuit aircraft. The Poles, like the Ethiopians, were almost totally defenseless against mechanized warfare; troops and supply lines were quickly torn to shreds. By Sept. 8, Gen. Gerd von Rundstedt (*q.v.*) was at the outskirts of Warsaw; by Sept. 28, Warsaw was in ruins. On Sept. 17, Russian armies moved into the eastern half of Poland, as agreed by the Soviet-German treaty, and the country was formally divided on Sept. 28. The Polish government fled to Rumania, where it was interned; escaped Polish patriots formed a government-in-exile in France, later retreating to England when France fell.

"Phony War." The Polish campaign was over so quickly that the British and French had not been able to send even a single airplane to assist their ally. A curious quiet descended. Except for a British naval blockade of Germany, countered by submarine warfare, there was no fighting in the West for the next six months, although French troops had occupied some bits of German soil just across the border. Many a wishful Englishman, Frenchman, and American perhaps thought the whole situation to be a vast international bluffing game, not to erupt into a real war. France even began to demobilize, and Great Britain, still under the spell of appeasement, counted 1,250,000 unemployed. Americans, calling this phase of the conflict "phony war," remained aloof of the troubles in Europe.

During this period, Britain drove German shipping from all seas except the Baltic. Germany carried on the sea war with submarines, planes, mines, and pocket battleships, thus jeopardizing neutral as well as belligerent shipping. The U.S. Congress passed a new neutrality act which forbade loans to belligerents, Americans to travel on ships of the belligerent countries, and arming of U.S. merchant vessels. The act permitted, however, the sale of any kind of goods to nations which could pay in cash and which could reach American ports with their own ships. These provisions excluded trade with Germany and Italy but not with Japan, to whom U.S. shippers continued to sell scrap metal and other supplies. The President was authorized to order U.S. ships to stay out of "combat zones."

Soviet-Finnish Campaign. During the calm in the West, the Soviet Union was not idle in the East. After claiming the eastern half of Poland,

THE RUSSO-FINNISH WAR

In November 1939 the U.S.S.R. invaded Finland and after a series of costly reverses managed to defeat the Finns. The picture shows Finnish machine gunners in a wind-swept outpost

International News Photo

Russia forced Lithuania, Latvia, and Estonia to grant her air and naval bases. When Finland refused to yield to a similar demand plus a demand for outright cession of some Finnish territory, the Soviet Union, without declaring war, invaded Finland on Nov. 30. Even the powerful Russian armies were slowed by the dogged courage of the Finns and the rigors of a severe winter. This apparently wanton act of Communist aggression incensed the democracies. Frenchmen, plus anti-Fascist Spaniards and Italians, volunteered with the Finnish army. The U.S. lent Finland $10,000,000. The League of Nations, roused to action, canceled the Soviet Union's membership. Not until March 12, 1940, was Finland forced to surrender.

Nazi Drive to the North. If the democracies had been idling during the six months of the phony war, Hitler had not. German factories were pouring out increasing numbers of planes, guns, tanks, and munitions of all kinds. While the armed forces were being trained to near perfection, the Nazi propagandist, Dr. Joseph Goebbels (*q.v.*), was attempting to lull the democracies into believing in German good intentions. And organized Nazi sympathizers outside Germany—notably in France, the Scandinavian countries, and the U.S.—were planning their fifth-column program of sabotage, espionage, and creation of national disunity.

Suddenly, on April 9, 1940, German troops (despite nonaggression treaties) poured into Denmark (*q.v.*) and crossed the Skagerrak into Norway (*q.v.*) where Vidkun Quisling (*q.v.*) had prepared for their arrival. At the appointed hour, Nazi soldiers swarmed from the holds of ships in every Norwegian port, and armed "tourists" by hundreds poured from hotel rooms. So swift and effectively coordinated was this fifth-column activity with the German troop movement from Denmark that the Norwegian forces were virtually helpless. They withdrew to the rugged mountains, and King Haakon VII and the government escaped to England, there to form a government-in-exile. Several British expeditions made sporadic landings, but the troops and their supporting vessels were forced out by land-based German aircraft. Within two weeks Norway was, for practical purposes, completely under German control. This conquest of Norway and Denmark had the further effect of isolating and neutralizing—under German influence—highly industrialized Sweden (*q.v.*), whose mine and factory output was invaluable to Germany.

During April and the first week of May the British people awakened to the fact that this war was to be real after all. The Norwegian fiasco led to a popular demand that Prime Minister Chamberlain step down and that the dynamic Winston Churchill (*q.v.*), who had for several years been pointing out the real aims of Germany, take the helm.

Nazi Drive to the West. On May 9, 1940, the day before Churchill became prime minister, Hitler assured the Dutch and the Belgians that they had nothing to fear, provided they should offer no resistance to a German drive through their countries to permit Nazi control of the coasts. They refused. Within hours, German bombers were wrecking Rotterdam and Amsterdam and armored units were smashing toward the coast. After counting 80,000 casualties in four days, the Dutch surrendered; the royal family and the government escaped to England to set up a government-in-exile. Two weeks later (May 28), King Leopold III (*q.v.*), after some ineffectual fighting, surrendered Belgium (*q.v.*), leaving the French flank hopelessly vulnerable. Luxemburg (*q.v.*) had been overrun on the first day of the German offensive. The Germans soon were pouring around the Maginot Line. By May 17, their breakthrough west of Sedan had been widened to 60 m. and they were moving toward the English Channel.

The Germans had in the West ten armored divisions supported by 126 infantry divisions. In contrast, the French army had only 80 divisions and the Belgian 22; the British had ferried ten divisions across to northern France. The Allies' mechanized forces were not comparable in size or quality to the German, and even if they had been, the German air force outnumbered the Allied planes by three to one.

Dunkirk and the Battle of France. Some 337,000 British and French troops were quickly trapped near the little seaport of Dunkirk (*q.v.*). Here, between May 28 and June 4, 1940, occurred the most dramatic evacuation in history. From out of London estuary and every eastern and southern English harbor streamed a motley procession of 887 seagoing craft of every description, naval and volunteer civilian. While the Royal Air Force fought off German aircraft, these vessels—pleasure boats, fishing boats, and merchantmen—plowed back and forth across the English Channel, rescuing thousands of soldiers, whose equipment had to be left behind.

By the end of May, the French army had been greatly reduced, and, by June 10, the remaining forces had been segregated into pockets, unable to fight with any prospect of success. The Maginot Line lay outflanked and useless. To spare Paris the fate of Rotterdam, the French evacuated the government and all troops; the Nazis entered the city on June 14.

Seeing France on the verge of defeat, Mussolini decided to come to the assistance of his Axis partner. Italy declared war on France and Britain on June 10 and cautiously sent a column of troops a few miles into southeastern France. Twelve days later the Battle of France was won by Germany.

On June 21, Hitler received a French armistice delegation at Compiègne, in the same railroad car in which Gen. Foch had met the defeated Germans in 1918. By the terms of the armistice, France was divided into two parts. The Germans were to control more than half of France, including all the Atlantic ports; the French were to demobilize at once and turn their fleet over to German or Italian control. The southern part of France, with government headquarters at Vichy, fairly well cut off from the rest of the world, was to remain nominally under French rule. (See *Laval, Pierre; Pétain, Henri Philippe.*) Only a group outside France, calling themselves Free French and led by Gen. Charles de Gaulle (*q.v.*), carried on the fight; but an anti-Nazi "underground" movement was soon to emerge.

The Battle of Britain. With almost all of Western Europe now in his hands, Italy as an ally, Spain a sympathetic bystander, and Russia ostensibly an ally, Hitler could not understand why the English did not face their fate and surrender. They had no army to speak of and only a few hundred fighter planes. With submarines and land-based air power, the Germans could theoretically control the English Channel regardless of the still powerful Royal Navy. In anticipation of an invasion, German soldiers were singing "We're Sailing Against England." Instead, unable to visualize British determination, Hitler attempted to soften up England by aerial bombing. He "intuitively" expected the British, aware of Rotterdam and Warsaw, to see the light and surrender rather than be destroyed. Only half-heartedly did he prepare for an amphibious invasion. Right after Dunkirk, such an attempt might have succeeded; but when barges for the crossing were belatedly assembled, the British bombers wiped them out.

If Air Marshal Hermann Göring (*q.v.*) had employed his air power, which was then fully three times as great as England's, to eliminate British air force installations after the fall of France, instead of trying to frighten the British people into surrender by bombing their towns, the ultimate outcome of the war might have been drastically changed. During the first 11 days of Germany's air blitz (Aug. 8-18), the *Luftwaffe* (German air force) concentrated on the destruction of shipping and coastal towns. During this phase of the Battle of Britain, Germany lost four planes for each British plane downed. The German air force then changed its tactics and tried to destroy the British fighter bases; so far the fighters had carried the brunt of the British efforts to repulse the German attack. For two weeks (Aug. 24-Sept. 5) this method was tried; the *Luftwaffe* lost twice as many planes as the R.A.F. and four times as many pilots. However, while the British lost from one-fifth to one-fourth of their fighter planes, this phase cost the Germans only about one-eighth of their air force strength. Miraculously, when the strength of British fighter pilots was reduced to less than 1,000, Hitler suddenly called off this phase of the air war and ordered Göring to concentrate on bombing London in daytime—to destroy it, break the Englishmen's will to fight. For a full month (Sept. 6-Oct. 5), the people of London took the worst punishment that Hitler could send against them. Ten thousand bombs rained down during the first three weeks. Then the rate dropped off, because fewer Nazi bombers were getting through. The R.A.F., an improved advance warning network equipped with radar (*q.v.*), plus an increasingly effective system of antiaircraft artillery, all thoroughly coordinated, were exacting a heavy toll from the Germans. Most significantly, British aircraft factories were by now turning out considerably more new planes than the Germans could shoot down. Although they did not then know it, the Germans had, by November 1940, lost the Battle of Britain. The R.A.F. finished those strenuous months actually stronger in fighter aircraft than when the battle started, and the British Bomber Command was just beginning to come into its own. German cities were already beginning to feel the effects of bombing. Air Marshal Arthur T. Harris' Bomber Command was from the outset a ***strategic*** air force rather than a ***tactical*** air force trying to play the strategic part that had been attempted by the *Luftwaffe.*

Wide World Photo

ARMISTICE, 1940

Members of the French and German delegations meet in conference in the same railroad car in the Compiègne Forest, near Paris, in which the armistice ending World War I was signed. The 1940 armistice, signed June 22, provided for German occupation of over one-half of France

The Germans continued to bomb London and other British cities during 1941. They did great damage: from August 1940 through December 1941 some 44,000 Englishmen were killed and 50,000 were injured. But the British spirit never considered surrender, and the German army never crossed the English Channel.

New Fronts. While the British people were bearing up under the German air assaults, five new fronts were opened in 1941 and 1942. These fronts were both economic and military. (1) British production figures began to increase month by month, and the U.S. assisted the British at an accelerating rate. For example, in September 1940, the U.S. traded 50 over-age destroyers to Great Britain in exchange for 99-year leases in eight British colonies in the Western Hemisphere, to be used for air and naval bases. On March 11, 1941, Congress passed the Lend-Lease Act (*q.v.*) and, on Nov. 7, 1941, repealed the Neutrality Act of 1939, thus lifting the ban on arming merchant ships and permitting them to enter combat zones. (2) German submarines intensified their efforts to keep U.S. goods from reaching the British Isles, and they began to exact a heavy toll of Atlantic shipping. (3) Italy opened an African campaign to approach the Suez Canal and so cut Britain's Mediterranean life line to the Orient. (4) Hitler, abandoning for the moment his hope of invading England, resumed his drive to the East. (5) The Japanese, perhaps coordinating their moves with those of Germany and Italy, began their drive south of China.

Britain's unemployment problem of the phony war period was a thing of the past. Under the leadership of Churchill, Lord Beaverbrook, Clement Attlee, Ernest Bevin (*qq.v.*), and others, British men and women were working around the clock, producing war matériel in vast quantities and turning every available square mile into farm land. Labor, fulfilling its "no-strike" pledge to the coalition government, turned out weapons instead of consumer goods.

The U.S. now realized the danger of Hitler's possible victory. In the summer of 1940, Congress enacted America's first peacetime draft law. By November 1940, a total of $11,000,000,000 had been appropriated for defense. A new "two-ocean" navy was begun. By April 1941, tanks were being produced in quantity, and aircraft production was approaching a volume of 1,500 planes a month, equaling the combined production of both Germany and Great Britain. During the Presidential campaign of 1940, both Franklin Delano Roosevelt and his Republican opponent Wendell L. Willkie (*qq.v.*) pledged aid to Britain "short of war" (see also *United States:* "Arsenal of Democracy"). The U.S. responded generously to Churchill's plea, "Give us the tools, and we'll finish the job." Despite production problems and the submarine menace, British orders were being filled. The U.S. went on to obtain outlying defense bases: with their consent, Greenland and Iceland were occupied by U.S. troops.

Italian Bid for Empire. Immediately after (as President Roosevelt put it) "stabbing France in the back" on June 10, 1940, Mussolini ordered his troops in East Africa to take British Somaliland, Kenya, and the Sudan. After some preliminary successes, they were turned back by January 1941. In November 1940, an Italian army in Libya had been ordered to strike toward the Suez Canal. The Italian push was formidable, but British and Commonwealth soldiers from Australia and New Zealand, with the help of the Royal Navy, managed to dispatch enough forces to Egypt to overcome this threat. The Italians lost Eritrea, Somaliland, and Ethiopia in the east, and Gen. Sir Archibald Wavell (*q.v.*), with R.A.F. support, pushed the Italian army back into Libya, inflicting heavy casualties and taking 133,000 prisoners. The Italian fleet had meanwhile been defeated, and an army sent into Greece from Albania late in 1940 was forced back by Greek and British forces with heavy losses.

Nazi Drive to the East. By mid-1941, Germany was about ready to resume the eastward drive. Hitler realized that the huge output of British and American industry could eventually overwhelm the output of Germany and her captive nations. He also could not be sure how long the U.S. might stay out of the war. If he could not land in Britain, it seemed best to eliminate the U.S.S.R. to prevent a two-front war. Already since 1939, without much fighting, the Soviet Union had been expanded by 24,000,000 people and 281,000 sq. m. Was Hitler driving to the East or was Stalin driving to the West?

When Russia seized part of Rumania in August 1940, Hitler ordered a political campaign to Nazify the Balkans and the Middle Eastern countries. By the end of 1940, Nazi agents had taken over Hungary and what was left of Rumania (*qq.v.*). During March 1941, Bulgaria (*q.v.*) joined the Axis Powers. So did a Yugoslav government in April, but the Yugoslav people rebelled and King Peter II ordered his army to resist German aggression. Within a short time, however, German prongs supported by air units split Yugoslavia (*q.v.*) and advanced into Greece, where they forced an evacuation of British troops, who had been dispatched to stop the Germans, to the island of Crete. In May, the Germans invaded Crete, largely with airborne forces, and the British had to evacuate again, this time to Egypt. The British ground and naval forces had been forced to retreat by the *Luftwaffe;* again, as in Holland, the decision had been gained by air power.

The Battle of Russia. With her right flank secure against opposition and with England still digging out of the ruins wrought by bombing, Germany now felt free to attack the U.S.S.R. Some 3,000,000 well-trained German troops, with what appeared to be adequate air support, were poised against about 2,000,000 well-equipped Russian soldiers, plus a considerable air force. In addition, there were some 8,000,000 other Soviet troops in reserve or in training, and millions of civilians were being prepared for guerrilla warfare.

At 3 A.M. on June 22, 1941, using Russian rejection of some impossible demands as a pretext for war, Germany launched an "all-out" attack on the Soviet Union. Almost simultaneously, three Nazi armies, totaling about 180 ground divisions, with thousands of tanks and planes, pushed into Russia. The one in the north was moving toward Leningrad, where it would be met and supported by the Finns, who had historic grievances, a recent defeat, and lost territories to avenge. The central offensive was aimed at Moscow, to capture and crush the seat of government. The southern force was heading for the Ukraine and the Black Sea. Within a few hours a front some 2,000 m. long was ablaze.

The Russians offered the German war machine its first real test of strength: their artillery was quickly recognized as outstanding, and the German air force soon learned that Soviet airmen and aircraft could give an excellent account of themselves. It was several weeks before the Germans were able to pierce the Russian lines; their armored units, however mobile, could not afford to penetrate very deeply lest they be "nipped off." Some contingents advanced farther than others, trapping and engulfing less mobile Russian units; but these encircled Soviet forces simply remained stationary and, with guerrilla support, continued to sap German strength.

The Western nations, although gloomily predicting that the war would be over in a few weeks, offered aid to the Soviet Union. Great Britain signed a treaty of alliance with Russia on July 13, in August backed a Russian demand that Iran expel several thousand Germans as a potential fifth column, and the next month joined Russia in occupying Iran to insure the supply line via the Persian Gulf. Supplies to Russia from the West had to be moved overland across Iran or taken by the submarine-infested sea route around the North Cape to Archangel and Murmansk; despite the transport handicaps, millions of tons of supplies subsequently reached the Russians. The Russians continued the colossal task of moving much of their heavy industry behind the Urals, out of reach of enemy bombing or possible capture.

By the end of August 1941, the Germans, supported by Finns in the north, Hungarians in the center, and Rumanians and Italians in the south, had overrun thousands of square miles, captured hundreds of cities and towns, and spilled vast quantities of Russian blood. But they were still far from achieving their major objectives. During September, Leningrad was virtually surrounded by 40 German divisions and a Finnish army headed by Marshal Carl Gustav Mannerheim (*q.v.*). Despite a historic siege, during which the city was pounded by bombs and artillery for months and during which an estimated 1,000,000 people died, mostly by starvation, the city did not surrender. In the center, Germans and Hungarians moved closer to Moscow but were slowed down by the bitter Russian winter, for which the efficient Germans had, unaccountably, not prepared; in December, the invaders were stopped some 14 m. from Moscow and, in several spots, actually thrown back. The greatest Axis successes were in the south, where, at terrific cost, the Germans took Kiev and cut the Crimea off from the Ukraine. By the end of October, the Axis forces had overrun an area of some 580,000 sq. m. The Russians, however, believed in defense in depth—retreating to exchange space for time and, as they did so, destroying all usable goods behind them; thus the German advance forces were constantly trailed by ever-lengthening supply lines.

Japan's Drive to the South. While the German drive to the East was slowing to a stop, the Japanese drive to the south was not. In June 1940, when France fell, the Japanese immediately moved to seize Indo-China (*q.v.*). Plans were under way for the conquest of the whole of Southeast Asia, plus the Philippines and the Netherlands East Indies (*qq.v.*). Prime Minister Hideki Tojo (*q.v.*) of Japan knew that such expansionist moves would probably mean war with the U.S., but the occasion seemed opportune.

Early on Sunday, Dec. 7, 1941, without warning—while, in fact, Japanese envoys were supposedly engaged in peaceful negotiations in Washington—Japanese carrier planes attacked the U.S. naval base at Pearl Harbor (*q.v.*), Hawaii. Six U.S. naval vessels, including a battleship, were sunk; other ships and many aircraft were destroyed or so seriously damaged that the U.S. was unable to counterattack. At the same time, other Japanese naval forces attacked the U.S. base islands of Guam, Midway, and Wake; troops invaded Hong Kong, Thailand, and Malaya; and aircraft attacked air and naval installations in the Philippines.

Within 24 hours, declarations of war were cabled back and forth across the Atlantic and Pacific; now Germany and Italy, too, declared war against the U.S.

A Year of Climax. The year 1942 did not see World War II reach its fullest fury, but it did see a climax. The Germans made their deepest penetration into Russia, and the Germans and Italians advanced to within 70 m. of Alexandria, Egypt, the gateway to the Suez Canal. The Japanese reached the most westward, most southward, and most eastward points of their advance. In each area of conflict, however, 1942 was a turning point, as each Axis partner found its lines overextended.

Stalingrad. The Germans and Finns never took Leningrad; its defense was one of the most gallant in military history. The Germans in the center never took Moscow despite months of furious fighting. German strategy in 1942, however, was not primarily concerned with these northern and central cities; there was a more important goal, the oil of the Caucasus, far to the south. In July and August, two tremendous drives carried one German army to the Caucasus and another to the Crimea. In August and September, Gen. Friedrich von Paulus (*q.v.*), with 340,000 men, penetrated the outskirts of the city of Stalingrad (see *Stalingrad, Battle of*). Red soldiers and guerrillas defended the city street by street and house by house. After the Germans had lost 180,000 men, they withdrew, and the *Luftwaffe* was ordered to destroy what was left of the city. More than 1,000,000 tons of bombs blasted Stalingrad into a heap of rubble. Von Paulus launched a new assault on Oct. 14, 1942, to capture the city before the winter set in, but he was blocked by a new Russian force under Marshal Gregori Zhukov (*q.v.*). The year ended with Gen. von Paulus and his remaining 185,000 men completely trapped. He finally surrendered, with 15 lesser generals and vast amounts of ammunition, tanks, and other supplies, on Feb. 2, 1943, after his surviving forces had been decimated; the German air force had also suffered enormous casualties.

The "Desert Fox." The Italian attempt in 1940-41 to reach Suez had been disastrous, and Hitler was forced to send the elite *Afrika Korps* under Gen. Erwin J. Rommel (*q.v.*) to save Libya from the British. In March 1941 Rommel launched a drive which carried his forces to western Egypt. With new American-made equipment, the British, by November, were ready for another offensive. Rommel was soon in full retreat—all the way back to Bengasi. Both sides now took time out for reinforcements. Rommel, with shorter supply lines, managed to get his new offensive under way before the British were ready. By deceit and daring, the "Desert Fox"—as Rommel had by then become known; his generalship was brilliant—inflicted heavy losses on the British, and by July 1942 he had driven them back eastward to El Alamein. Now, however, the supply lines of the British were short and Rommel's were extended. On Oct. 23, the new British commanders, Generals Bernard L. Montgomery and Harold Alexander (*qq.v.*), loosed a series of crushing blows. The *Afrika Korps* was pushed back 1,400 m.; Rommel, returning from a German hospital, finally was able to make a stand along the Mareth Line in Tunisia (*q.v.*).

Sovfoto

THE BATTLE OF STALINGRAD

German prisoners are led through the streets of war-torn Stalingrad, Feb. 2, 1943, at the close of the epic battle which many consider to have been the turning point of the war. During the 155 days in which the battle raged, the *Wehrmacht,* under Gen. Friedrich von Paulus, lost more than 330,000 men in killed and wounded

Part of this German-Italian retreat was deliberate, for word had come that on Nov. 7-8 a huge convoy of 140,000 American and British troops under Gen. Dwight D. Eisenhower (*q.v.*) had landed in Morocco and Algiers. The end of 1942 saw the tide turning in Africa as well as in other places.

Japan's Zenith. Holding complete air and naval supremacy in their part of the world, the Japanese moved from victory to victory. Their land-based planes sank two of England's best warships, the new battleship *Prince of Wales* and the battle cruiser *Repulse,* on Dec. 10, 1941, when these vessels ventured up the Malay coast without air cover. The loss of these vessels, following the Pearl Harbor disaster, left the Southeast Asia area singularly vulnerable. The Japanese quickly overran the Philippines, which Gen. Douglas MacArthur (*q.v.*) had defended until he was ordered to Australia, where he might reorganize Anglo-American plans for Asiatic defense. A valiant rearguard under Gen. Jonathan Wainwright (*q.v.*)

held the Bataan Peninsula outside Manila until April 9, 1942, and another group (also under Wainwright's command) held fortified Corregidor Island in Manila Bay until May 7.

Meanwhile, the Japanese moved from Indo-China into Thailand (*q.v.*) and thence into British Malaya. The great British naval base of Singapore (*q.v.*), attacked from the landward side, surrendered on Feb. 15, 1942. Burma (*q.v.*) was next: Rangoon fell on March 7; Lashio, which controlled the Burma Road to China, was occupied on April 30; Mandalay fell on May 2. Other Japanese forces were already taking and occupying the East Indies. The Celebes, Rabaul, New Ireland, the far-away Solomons, and Amboina (*qq.v.*) had all been occupied during January.

On April 18, Tokyo was thrown into a short-lived panic. It was bombed by 16 U.S. carrier-based B-25's, under the command of Col. James Doolittle (*q.v.*), which made no attempt to return but landed on the mainland. The attack did little damage, but it served its purpose, which was to let the Japanese know that mere distance could not forever deter an airborne enemy.

The Japanese suffered their first setbacks in the Battles of the Coral Sea (May 7), in which the loss of the U.S. carrier *Lexington* was more than offset by the Japanese loss of 15 ships, and Midway (June 4-7). In these first naval battles in history to be fought by air, without contact of the opposing fleets, land- and carrier-based planes forced a Japanese withdrawal. In June, however, the Japanese occupied the islands of Attu and Kiska in the Aleutians. This eastward venture was the zenith of Japanese conquest (as the German drive for the Caucasus at the same time marked the high tide of Nazi military success).

During the last six months of 1942, the Japanese faced determined opposition. In July, the Chinese Nationalists defeated the invaders in Kiangsi Province and stopped the Japanese drive inland. In August, the U.S. Marines landed in the Solomons and seized Tulagi and the Japanese airfields on Guadalcanal (*q.v.*). From September on, Gen. MacArthur, Allied commander in the Southwest Pacific, received substantial reinforcements. In mid-November, a three-day naval battle in the Solomons put an end to Japanese hopes of further expansion, and by December the Americans and their Allies were preparing to move back northward—3,500 m. to Tokyo.

A Year of Build-Up. The year 1943 was one of planning and build-up. It opened and closed with two important conferences. On Jan. 14-24, President Roosevelt and Prime Minister Churchill met at Casablanca with Gen. Eisenhower and other Allied commanders, mapping campaigns which would force "unconditional surrender" of the Axis partners. On Nov. 28-Dec. 1, the two government leaders met with Marshal Stalin at Teheran, the capital of Iran, to complete agreements on war plans and to iron out certain strategic, tactical, and political differences. There had also been other high-level conferences during the year, including a foreign ministers' meeting in Moscow (October), to discuss a world society for the preservation of peace, and a conference by Roosevelt, Churchill, and Chiang Kai-shek in Cairo (November) to plan future military operations against Japan.

International News Photo

SERVICEWOMAN

This member of the Women's Reserve of the Navy (WAVE) is representative of the many women who served in the armed forces of the U.S. Other women served in the Women's Army Corps (WAC), the Women's Reserve of the Coast Guard (SPAR), and the Women's Marine Corps

By 1943, British, American, and Canadian industry were fully geared to war production and the manufacture of thousands of matériel items. Scientists on both sides—Allied and German—worked feverishly, in collaboration with the military men, the industrialists, and the technicians, all in super-secrecy, to evolve new inventions, new techniques, and new instruments of offense and defense. Thousands of new devices, and new words for these, appeared: Radar, sonar, and sonar absorption; land and sea mines, mine detectors, and mine sweepers; proximity fuzes and homing devices; electric torpedoes, recoilless machine guns and tank-destroying rocket guns; bombs of increasing destructiveness, from small incendiaries to the massive "block-busters"; new types of planes, ships, vehicles, and guns, of many sizes and for many purposes; RDX, henonite, torpex, and other new high explosives; intricate and increasingly accurate bombsights and gunsights. The relatively new age of electronics was coming into its own as human eyes and brains and muscles proved too slow for mechanized war. The Germans were working to produce Hitler's boasted "secret weapons" to decide the war; in the latter years they produced the ram-jet V-1 flying bomb and the rocket-propelled V-2 (see *Rocket*). Germans and Allies alike were devising turbo-jet and thrust-jet planes. Almost simultaneously, both sides were racing in deepest secrecy toward the production of nuclear chain reactions (see *Atomic Energy; Military and Naval Progress*). Meanwhile, millions of American and Allied men, as well as thousands of women, were being trained to wield the new weapons in this most complex and dispersed of all wars.

The Battle of the Atlantic. Fairly early in the war, the British fleet had driven the surface vessels of the German navy from the high seas and, as in World War I, the Germans concentrated their naval production upon submarines. During 1942 the number of U-boats in operation rose from about 200 to some 530. The German hope for winning control of the seas was submarine production. Due to the newly developed "snorkel," an extensible air intake, German submarines could spend far more time underwater than ever before. A new fighting technique was developed: "wolf packs" of from 8 to 16 submarines, each under one commander, would slip into the midst of a convoy, rake naval and cargo vessels with torpedoes, and then slip away or drop to rest in deep waters until they had evaded pursuit. (Their very numbers helped to distract or divert pursuers.)

Improved detection devices (*e.g.*, sonar, *q.v.*), improved depth charges, and new "hunter-killer" techniques enabled the Allied navies to destroy increasing numbers of Nazi submarines, despite simultaneously developed evasive and defensive techniques. U-boats, plus magnetic mines and mines planted by being dropped from aircraft, had, by the end of 1943, sunk 22,161,000 gross tons of Allied shipping. Gradually during 1943, the U.S. and British navies, aided by the R.A.F. Coastal Command and the U.S.A.A.F. Anti-Submarine Command (which had already made it too expensive for the U-boats to operate near shore), began to overcome the submarine menace. By the end of the year, more submarines than cargo vessels had been sunk; Germany was losing the Battle of the Atlantic.

Of equal significance in this struggle was the fact that by the end of 1943 Allied shipyards were building three times as many ships per year as were being lost, while German submarine replacements were declining. British and U.S. shipyards built 10,974,000 more tons of shipping than had been lost during 1943. The year closed with the sinking by the British of the German pocket battleship *Scharnhorst,* whose mere existence as a potential raider had immobilized a part of the British fleet.

The Russian Counteroffensive. The worst land fighting in 1943 took place in southern Russia. The Soviet Union was by now receiving vast quantities of supplies from the U.S., through Murmansk in the north and across Iran to the south. With these supplies to supplement their own stepped-up production, the Soviet army during the spring slowly forced the Germans back. In July the Germans stopped retreating and launched a powerful summer offensive. During July and August, however, the Germans lost their air supremacy. Some 6,000 new U.S. planes had reached Russia and been put into action; meanwhile, the German aircraft factories had begun to suffer from the day raids of the U.S. Eighth Air Force and the night raids of the R.A.F. Bomber Command. Without air superiority, the Eastern campaign was lost; within four months the Nazis had been forced to abandon more than half of the vast territory they had taken in the U.S.S.R.

In the meantime, the Germans and Italians had been driven from North Africa. The British Eighth Army broke through the Mareth Line and moved in from the south upon the Axis forces in Tunis; the American Second Army, aided by French and British forces, was moving in from the west; and the Mediterranean Allied Air Forces had gained air superiority over both land and sea. The Axis forces were trapped and helpless. The African campaign had cost them nearly 1,000,000 men, 8,000 airplanes, and 2,500,000 tons of shipping. It was all over by May 12, 1943.

The Battle of Italy. On July 10, with almost complete control of the air, Gen. Eisenhower and his British deputy, Gen. Harold Alexander, with 2,000 ships began the landing of 160,000 American, British, and Canadian soldiers in Sicily. In two months these Allied troops had defeated the Germans there and were ready to move on to Italy.

Faced by invasion, Mussolini asked Hitler for German reinforcements, but there were none to spare. When Mussolini reported this development to his Fascist Grand Council on July 26, he was deposed by the council and arrested. His place as premier was taken by Marshal Pietro Badoglio (*q.v.*), who in turn was unable to stem the invasion. On Sept. 2, Montgomery's Eighth Army landed at the tip of the Italian peninsula, and on Sept. 8 an Anglo-American amphibious force landed at Salerno, southeast of Naples. Badoglio's unconditional surrender was announced on the same day. Three days later, Nazi paratroopers, in a bold venture, overpowered the guards to rescue Mussolini, who was then flown north and set up as a Nazi-controlled puppet leader to urge the Italians to continue fighting. Hitler was now compelled to divert German troops from elsewhere to slow the Allied advance up the peninsula. Despite the surrender of the Italians, hard fighting continued and was continuing on a line south of Cassino as 1943 ended.

The Battle of the Pacific. The commanders in the Pacific area—Gen. MacArthur, Air Force Generals Kenney and Harmon, and Admirals Halsey and Nimitz (*qq.v.*)—during 1943 and 1944 had been constrained by the decision of Roosevelt, Churchill, and the Combined and Joint Chiefs of Staff (headed by Gen. George C. Marshall, *q.v.*) that the Pacific forces would have to wait for full matériel support until victory in Europe was assured. Meanwhile, with what support they did have, they began "island hopping" across 3,500 m. of ocean toward Japan. The general objective of this strategy was not the reconquest of territory for its own sake but, rather, the acquisition of air bases. A combination of U.S. naval carrier task forces and Army Air Forces would defeat local land-based or carrier-based Japanese air forces. Then, with air coverage, the Navy would transport Marines and Army ground forces to seize Japanese air bases. At the same time the Seabees (*q.v.*) would be working against great odds to repair captured air strips or build new ones as successive islands were taken. The process was repeated over and over. General MacArthur was able during 1943 to announce the successive capture of air fields on Rendova Island, Salamaua, Munda, Lae, Finschhafen, Bougainville, in the Gilberts, and at Cape Gloucester. The process seemed somewhat slow, but it was progress.

A Year of Decision. The year 1944 was the big year of the war. Germany took an appalling amount of bombing from the Allied strategic air forces. The Nazi armies were largely driven out of Russia. The Allies advanced beyond Rome into north central Italy. Successful landings in France (D-Day, June 6, 1944) under Gen. Eisenhower were followed by the liberation of France and Belgium. In the Pacific, Gen. MacArthur returned to the Philippines and the U.S. Navy wore away Japanese sea power. Army units and U.S. Marines seized islands from which Gen. H. H. Arnold's 20th Air Force began the bombing of Japan's home islands, while Japanese defense forces helplessly awaited an invasion that was destined never to come.

As far back as 1942 the R.A.F. had managed to stage several 1,000-plane raids on German cities, visiting on Cologne and Essen some of the same type of mass destruction the Germans had delivered to Coventry. Then, in one three-night series of raids in July and August 1943, Hamburg was one-third destroyed. The R.A.F. kept up its night raids on German cities, while the U.S. Army Air Force in day raids concentrated on specific target systems: aircraft factories, the ball-bearing industry, and the petroleum industry. These moves forced the *Luftwaffe* into a war of attrition for its own survival.

In this battle for air supremacy, the U.S.A.A.F. and the R.A.F. lost heavily. The A.A.F. lost 18,000 planes and 79,265 airmen, and the R.A.F. lost 22,000 planes and 79,281 airmen. When this phase of the struggle was over, the German aircraft factories were producing more planes than ever, but the nation's best pilots were gone, and by June 1944 German oil reserves were so depleted that the training program had to be stripped to the bone. Fewer and fewer German planes came up to meet attacks, and during the summer of

D-DAY

On June 6, 1944, at 3:30 A.M. (New York time) came the news the entire world had been waiting for: "The Allies have landed in France." The second front was opened on the beachheads of Normandy, as wave upon wave of men and supplies were landed. The Allies rapidly enlarged their beachheads and began the advance which ended with the surrender of Germany in 1945

1944 the Germans definitely lost the battle for air supremacy.

In June 1944 the Combined Bomber Offensive, which had been planned at Casablanca, began to become effective. Until then, only some 400,000 tons of bombs had been dropped over Germany and damage had been considerably less than decisive. After the Germans lost the battle for air superiority, however, Allied bomb tonnage rose sharply. Within a year the total tonnage dropped on Germany had reached 1,356,808. Fifty cities lay in ruins; 3,500,000 dwellings had been destroyed or damaged; 7,500,000 Germans were homeless; and 1,080,000 people had become bomb casualties. Still more important militarily, German transportation and supply had been hopelessly crippled. Germany's oil reserves by June 1945 had been reduced to eight per cent of what they had been in March 1944. What damage the Combined Bomber Offensive might ultimately have totaled can only be estimated. At least twice as much bomb tonnage might have been dropped on "strategic" targets had not Allied air power been diverted to "tactical" operations—to drop bombs in support of invading ground forces.

The Soviet Liberation. In January 1944 Novgorod in the north was recaptured by Soviet forces, which then pressed on into Estonia and by March were ready to begin the liberation of Poland. In February the Russians destroyed 10 German divisions in the Ukraine and by March were moving toward the liberation of Rumania. During April and May the Germans were cleared out of nearly all of southern Russia, and in June and July those in the center were steadily pushed back. In June the Finns were again fighting desperately on their own soil. The German commanders in the East were calling for reinforcements and for oil to keep their mechanized forces operating; but the Allied invasion of the West (June 6) prevented the sending of reinforcements, and the German oil supply was running lower as the Combined Bomber Offensive took its toll—while during the same period huge quantities of American war matériel continued to arrive in Russia. Between July and October the Russians retook Estonia, Latvia, Lithuania, Rumania, Bulgaria, and Yugoslavia (*qq.v.*). Meanwhile, in Poland, a patriotic, non-Communist "underground" force stood ready to rise against the Nazis. As the Russians approached Warsaw they did rise; then, for reasons still unexplained, the Russians halted for two weeks (Sept. 14-Oct. 2) while the Nazis slaughtered some 200,000 Polish patriots and almost leveled the remains of Warsaw. Only then did the Russians move into the battered capital.

SHAEF IS FORMED

General Dwight D. Eisenhower (*center*), supreme commander of the Allied Expeditionary Forces, poses on Dec. 24, 1943, with the other members of SHAEF (Supreme Headquarters Allied Expeditionary Forces). Also shown are Sir Arthur Tedder (*left front*), Sir Bernard Montgomery (*right front*), Lt. Gen. Omar Bradley (*left rear*), and Lt. Gen. W. B. Smith (*right rear*)

Courtesy British Information Services

The Battle of Italy (*continued*). The invasion of Italy had stalled on a line just south of Cassino during the last quarter of 1943. A landing at Anzio, farther north, in February 1944, failed to divert the Germans from their strong Cassino line; and an attempt to drive northward from Anzio to Rome also bogged down. The Allied ground advance was not resumed until U.S. tactical air forces, in the spring of 1944, laid down a successful "interdiction" campaign—that is, a campaign of wrecking rail lines, bridges, and tunnels, blasting truck convoys, and breaking up columns of reinforcements. No longer able to bring in fresh troops, the German commanders could no longer hold their line, and Rome fell to the Allies on June 4. During July and August the Germans lost more territory but managed to draw a fairly stable line across north central Italy, from Ancona on the east, through Florence and Pisa, to Leghorn on the west. Here they were holding fast as 1944 ended.

The Second Front. For many months the Russians had been clamoring for the Allies to establish a full-scale second front to relieve the pressure in the East. For most of that same time plans had been evolving for a cross-Channel invasion of France. General Eisenhower had been moved from the Mediterranean area to England to head SHAEF (Supreme Headquarters Allied Expeditionary Forces). A huge amphibious force was assembled in southeastern England. More than 10,000 planes (including the strategic bombers) were to control the skies, as more than 4,000 ships and nearly 6,000 transport aircraft were to haul 2,200,000 Allied soldiers, 450,000 vehicles (besides tanks and mobile guns), and 4,000,000 tons of supplies across the English Channel. The invasion plans were well concealed, and the Germans were thus forced to keep 60 divisions of troops ready between Denmark and Bordeaux.

D-Day was June 6, 1944. After prolonged calculations and forecasts of weather and tide conditions, the Allies moved in on the Normandy coast under an impenetrable air cover. The Germans could not know whether this was the main attack or a feint; by the time the Allied air forces, after softening German defenses all along the coast, proceeded to isolate the Normandy landing area, it was too late to mobilize effective reinforcements. By July 12, the Allies had 1,000,000 well-supplied troops in France. They had forced their way across the Cotentin peninsula, had taken Cherbourg, and were fighting their way through the thousands of hedgerows where the defending Nazis had managed to dig in.

On July 18 the Allies cracked the German line at St.-Lô. After the air forces laid a concentrated bombardment over an area five miles wide, the U.S. First Army under Gen. Omar Bradley (*q.v.*) broke through into open country on July 25. A week later, the U.S. Third Army under Gen. George Patton (*q.v.*) followed, fanning out over Brittany while Bradley and British contingents moved toward Paris and then circled toward the left, forcing the Germans to withdraw northward to avoid being trapped. On Aug. 15 the Allies launched on the French Riviera a second invasion, to move northward up the Rhone Valley.

On Aug. 19 Paris was liberated by an uprising of underground forces and the approaching U.S. troops under Gen. Patton and Free French troops under Generals Charles de Gaulle (*q.v.*) and Jacques Leclerc. Now free to come out into the open, there appeared the thousands of patriots of the French *Résistance* movement who, since the Nazi division of France, had continuously risked their lives in sabotage, espionage, the rescue of downed Allied airmen, and in other "underground" activity directed toward the freeing of the nation.

Meanwhile, British and Canadian forces which had broken through the German lines in Normandy early in August were driving northward along the coast. A week after Patton took Paris, Canadian troops entered Belgium. Brussels fell, followed by the invaluable ports of Antwerp, Brest, Calais, and Dunkirk. The quick capture of these places and the surrounding coastal areas was indispensable to the British. Along this coast were the launching ramps for the pilotless aircraft known as V-1's and V-2's, which had been Hitler's last real hope for victory. These missiles, especially the giant V-2 which traveled at enormous speed and carried a 1,000-lb. warhead, were inflicting terrible damage on London and other British cities, exceeding even that of the blitz of 1940. After capturing the missile-launching sites, the British and Canadians drove on into Holland, while the Americans continued to liberate the rest of France and push on into southern Germany.

The Germans lost 750,000 men, while fighting a furious rearguard action, as they withdrew to their massive Siegfried Line, a fortified area—modeled after the French Maginot Line—running along the German border from Switzerland to Holland. General Eisenhower tried to overleap this line by dropping some 3,000 paratroopers near Arnhem, Holland, behind the German lines (Sept. 17). The American paratroopers were moderately successful, but the British First Airborne Division had trouble. To help, the Americans sacrificed tactical advantages; both forces had to retreat from Arnhem, losing two-thirds of their total strength, and the venture failed.

While the pockets of Germans in France and Belgium were being destroyed and the American Third Army was moving eastward to join the U.S. Seventh Army and the French First Army at Dijon, Gen. von Rundstedt, on orders from Hitler, on Dec. 16, pushed out from the Ardennes into Belgium and threw the Allied forces back to the Meuse River. The Germans were fighting in desperation; it took 1,000,000 Allied troops to stop Von Rundstedt's 250,000. This "Battle of the Bulge" was over by Christmas, and by New Year's Day, 1945, Generals Eisenhower, Montgomery, Bradley, Patton, and others were assembling their strength for a drive across the Rhine and on toward Berlin.

All the while, the R.A.F. and A.A.F. continued the curtailed Combined Bomber Offensive and also isolated the long Siegfried Line, or West Wall, while preventing the German air force, or what was left of it, from being much more than a nuisance to the Allied ground forces.

MacArthur Returns. While the soldiers, sailors, and airmen in the Atlantic-European area were fully occupied with defeating the Nazi-Fascist powers, the war in the Pacific seemed somewhat remote. In February 1944, however, naval task forces had invaded the Marshall Islands and had taken the airstrip islands of Kwajalein and Eniwetok. Successively, Pacific forces took the Admiralty Islands (March), New Guinea (April), and the Schouten group (May). On June 16, 1944, the same day the Marines took the Marianas, B-29 Superfortresses dropped their first bombs on Japan proper. On June 19, in the First Battle of the Philippine Sea, the Japanese lost two aircraft carriers. On Aug. 11 Guam was recaptured, and in September American forces landed on Morotai and the Palau Islands.

On Oct. 19, Gen. MacArthur landed on Leyte. The Japanese, seeing his promise to return to the Philippines being fulfilled, tried desperately to keep control of the surrounding waters; but in the Second Battle of the Philippine Sea, fought on Oct. 21-22, the Japanese fleet was all but destroyed.

In November and December B-29 Superfor-

International News Photo

BATTLE OF BISMARCK SEA

A Japanese destroyer wallows helplessly in the waves after direct hits from Allied bombs in the historic Battle of the Bismarck Sea, March 2, 1943

tresses began operating from Saipan in the Marianas—scores of them making the 1,300-m. run to Japan and dumping increasingly heavy loads of percussion and incendiary bombs on Japanese wood-and-paper cities.

Allied Drives from East and West. At the opening of 1945, 30 divisions of Von Rundstedt's troops were withdrawn from the West Wall to meet the advancing Russians in the East. After the Germans had killed the non-Communist defenders of Warsaw and retreated, the Russians had moved into the ruins (Jan. 12, 1945) and prepared to move westward. Now 215 Soviet divisions in the north and center began a drive and by Feb. 20 were within 30 m. of Berlin.

On Feb. 8 Gen. Eisenhower assembled his combined forces for the final push through the Siegfried Line. Cologne was taken on March 6, and on the next day the first American forces crossed the Rhine River. Von Rundstedt was replaced by Field Marshal Albert Kesselring (*q.v.*), but no mere change of leadership could now salvage the German hopes. By April, 1,000,000 Allied troops had crossed the Rhine. Churchill, anxious for political reasons to beat the Russians to Berlin, urged SHAEF to push straight through. But the generals, to whom at the moment military matters were necessarily more important than political consideration, saw too much possibility of being mousetrapped if they should drive a column straight through territory held by intact Nazi forces. Consequently, Gen. Eisenhower ordered a continuation of the campaign to cut off German troops into pockets, an operation which proved highly successful. After April 19 there was no longer a continuous German front. A million Nazi troops trapped in Italy surrendered on April 29. By May, Gen. Eisenhower's troops held all of Western Germany up to the Elbe River, 50 m. from Berlin.

By that time, however, the Russians had already entered the outskirts of the city. The week of April 23-30 saw Berliners fighting furiously, block by block and house by house, many of them hoping that the Americans would arrive so that they could surrender to them instead of to the Russians. In the same week, Göring and Heinrich Himmler (*q.v.*) deserted the cause, while Hitler and his companion Eva Braun were hiding in a steel and concrete shelter at the chancellery in Berlin. On April 29, Hitler called for Grand Admiral Karl Doenitz (*q.v.*) and appointed him his successor; then, the next day, he, Eva Braun, Goebbels and his family, and a few other top Nazis committed suicide rather than face capture. By then the Russians, who had advanced through the Balkans—starting in the late summer—and reached Vienna April 10, had taken untold millions of German prisoners and were ravaging Berlin.

The Western Allies had captured 3,000,000 enemy troops since D-Day; now, during this last week of April, 1,650,000 more surrendered. The Germans tendered unconditional surrender on May 7, 1945. By-passed Germans pocketed along the coast, together with those intact forces remaining in Denmark and Norway, received the word and laid down their arms. May 8 was officially proclaimed V-E Day, for "Victory in Europe."

The Drive to Japan. The final defeat of Japan, or V-J Day, was not to come until nearly four months later. The Japanese already knew that they were defeated; as early as April 7, 1945, they had tried to make contact with the U.S., by way of Moscow, to offer peace terms. For their own political reasons, however, the Russians withheld the request from the West; Stalin did not tell the Western leaders about it until the Potsdam Conference (July 17-Aug. 2, 1945).

In January and February the Japanese had fought bravely and desperately to hold the Philippines, losing some 450,000 troops in the effort. Their air force had also put up a good fight, but it was no match either in planes or pilot skill for the U.S. 5th and 13th Air Forces or for the fliers of the U.S. Navy. The waves of B-29's could not be stopped.

Before the war finally ended, the 20th Air Force had lost 437 planes and nearly 2,700 airmen to Japanese fighter craft, to antiaircraft fire, and other hazards. These losses were small, however, compared to the damage U.S. aircraft had inflicted upon Japan proper. Beginning on Nov. 24, 1944, and continuing until Aug. 14, 1945, the Superforts made 158 raids on Japanese airfields, rail facilities, and industrial targets. They burned out 158 sq. m. of urban area, leaving hundreds of thousands dead and some 8,000,000 people homeless. Toward the last, Gen. Curtis LeMay was announcing in advance which Japanese cities his planes were going to burn next. Still the Japanese did not surrender, although they had made three political gestures toward that end (April 7, June 20, July 10).

The U.S. Navy, especially the submarine force, had by 1945 almost destroyed both the Japanese naval forces and the merchant marine. Carrier task forces were now able to approach the home coasts of Japan, and naval aviators could add their weight of bombs to the amount being dropped by the Army Air Forces. Japan's fate had been sealed.

Meanwhile, the Allies had laid plans to invade Japan with sea-borne ground forces. Millions of American and British troops, with all their equipment, were to be transported across the U.S. and the Pacific Ocean just as soon as Germany should surrender. In anticipation of this gigantic campaign and to provide fighter air bases closer to Japan than were Saipan, Tinian, and Guam, the commanders decided to take the islands of Iwo Jima (750 m. from Tokyo) and Okinawa (330 m. from southern Japan). The conquest of these two islands made one of the bloodiest chapters in American military history. Iwo Jima, defended by 23,000 Japanese, was taken by 60,000 U.S. Marines (19,938 casualties) between Feb. 19 and March 16, 1945. Some 1,400 ships and 170,000 troops were required to capture Okinawa. Two hundred of these ships were hit by *kamikaze* (suicide) planes, fighter aircraft each piloted by a fanatical patriot whose aim was to fly his bomb- or torpedo-laden plane directly into a predesignated American vessel. Okinawa cost the Americans more than 45,000 casualties (12,250 dead). Some 118,000 Japanese died fighting; the last 10,000 surrendered on June 21, 1945. The way was now clear for the projected amphibious assault on the Japanese homeland.

Fighting on the Continent of Asia. Back in 1941-42, when the Japanese had made their drive to the south, they had by-passed Chiang Kai-shek's Nationalist forces in inland China. A huge Japanese force had been left in occupation of Korea, Manchuria, and northern and eastern China. Other forces had conquered the whole of Southeast Asia from Hong Kong to Singapore. This area included Burma, with its famous, tortuous Burma Road, over which the Chinese had been receiving scanty but essential supplies from India and the West. To offset this loss, the British and Americans had assisted in building the Ledo Road which, with a rail connection from India, once again connected Nationalist China with the Anglo-American forces. In March 1944, the Japanese invaded northeastern India and cut this tenuous new link. A force of British, American, and Chinese soldiers, with 1,000,000 Indian volunteers, fell upon the invaders, but their expulsion took half a year. From 1943 onward, the famous "Hump" operations of the U.S. Air Transport Command, set up at the request of Gen. Joseph Stilwell (*q.v.*), were ferrying basic essentials over the Himalayas, enabling the isolated Nationalists to keep fighting. The Chinese Communists, whom Chiang had been fighting for years, for the time being made common cause with the Nationalists to drive the Japanese from the mainland.

During the last half of 1944, the Allies pushed the Japanese out of India. Then, in 1945, they drove into the jungles of Burma, took Mandalay, and turned southward toward Rangoon, which fell on May 3. By mid-1945, the Japanese hold on Southeast Asia was becoming more and more precarious, at the same time that Chiang's Nationalist armies and those of the Chinese Communists, both now receiving substantial support from the Western Allies, were growing in strength.

The Atom Bomb. On Aug. 6, 1945, the world learned that the Japanese city of Hiroshima had been blasted by a single atomic bomb which had the force of 20,000 tons of TNT. This first atomic bomb had killed 66,000 people and had burned or injured 69,000 others; these 135,000 people

THE GERMANS SURRENDER

The German delegation (*seated left*), consisting of Maj. Wilhelm Oxenius, Col.-Gen. Gustav Jodl, and Gen.-Adm. Hans Georg von Friedeburg, listens as the terms of surrender are read by Gen. Eisenhower's chief of staff, Lt. Gen. Walter Bedell Smith, on May 7, 1945. The surrender took place in a little red schoolhouse at Rheims, France.

Wide World Photo

"I HAVE RETURNED"

Accompanied by his staff, Gen. Douglas MacArthur wades ashore on Luzon Island, in the Philippines, Jan. 23, 1945

Acme Photo

HIROSHIMA

Twisted wreckage and acres of rubble attest the power of the atomic bomb dropped on Hiroshima, Japan, Aug. 6, 1945

were half the population of the city. Two-thirds of the buildings in the city had been destroyed or damaged. President Harry S. Truman (*q.v.*)—who had succeeded to the Presidency upon the death of Franklin D. Roosevelt on April 12—on the advice of Secretary of War Stimson had authorized the use of the new bomb to prevent the tremendous loss of American lives which an invasion of Japan would have entailed.

The Soviet Union had denounced the Russo-Japanese nonaggression and neutrality treaty as early as April 5, 1945, but had not taken further action. Now, on Aug. 8, she declared war and moved troops into Manchuria. On Aug. 9, a second atomic bomb was dropped, this time on Nagasaki, with equally devastating results. The evidence was convincing; on Aug. 14, hostilities, which the Japanese had begun in Manchuria on Sept. 18, 1931, almost 14 years before, came to a close. The Japanese formally surrendered to Gen. MacArthur on board the U.S.S. *Missouri* in Tokyo Bay on Sept. 2, 1945, V-J Day. The actual war was over.

World War II Casualties. Estimates of the number of lives, military and civilian, lost during World War II run as high as 27,000,000. Nearly 30,000,000 other persons had been wounded in battle or injured by air raids. The total casualty list thus approximates 57,000,000.

The three Axis powers—Germany, Italy, and Japan—had suffered more than 14,500,000 casualties, or 27 per cent of the estimated total. Of these, Germany had lost 3,250,000 dead, 7,250,000 wounded, and additional numbers for whom only the Russians might account with any degree of accuracy. Japan had lost some 1,471,000 dead and 2,191,000 injured. Italy had lost 310,240 dead and counted 144,505 missing. Figures from behind the Iron Curtain are not available, but one non-Communist authority has estimated that 6,115,000 Soviet citizens lost their lives and 14,012,000 others were wounded, making up a total of more than 20,000,000 Russian casualties. The Poles, caught between the Fascist and Communist powers, lost more than 6,000,000; all except 123,000 of these had been civilians either killed or herded off to Communist labor camps. Another 1,600,000 wounded Poles had somehow survived. Yugoslavia had lost 1,700,000 dead. The other Central European peoples had lost 1,500,000, of whom about one-third have never been accounted for. Perhaps as many as 6,000,000 Jews had been literally slaughtered by the Nazis simply because they were Jewish.

The Western democracies which had been overrun suffered less severely. France had lost 166,195 military dead and 408,895 wounded, with 174,620 civilian casualties. The Benelux and Scandinavian countries had lost 150,000, more than half of whom were Finns. The British Commonwealth and India had suffered 1,246,797 casualties. Of these, 772,462 were Englishmen and Scotsmen, 403,195 of whom died. The U.S. lost 389,769 dead and 659,972 wounded, a total of 1,049,741.

Toward Winning the Peace

World War II had vitally affected almost every human being on earth. Fully a third of the population of the world had actually been exposed to war hazards. More than 100,000,000 men and millions of women had worn uniforms. All (or most) on the democratic side had hoped that the war would somehow produce a more stable and a "better" world; the vagueness of the concept foreshadowed the problems of peacemaking. Many of the contributing causes of World War II lay still unresolved when hostilities ended.

Competing Nationalism and Conflicting Ideologies. Germany and Italy and Japan, together with their extended national aspirations, had been defeated, but competitive nationalism was still very much alive in the world. Except in Spain, Fascism in its various mutations (German, Italian, Japanese) had been stamped out as a force; but conflicting ideologies remained. Communism equated Democracy with capitalism, Communism's diametric opponent, which Communism, according to Marxist theory, was "destined" to overcome. The Western democracies, on the other hand, were committed to individualism, to capitalism as the mainstay of individualism, to legal justice and abstract morality, and to constitutional liberties—all of which concepts were, if not anathema, at least largely unintelligible to the Communists. These two ideologies, each with its own form of nationalism to maintain, had been only temporary allies to eliminate a common enemy. Long-term understanding and "peaceful coexistence" seemed likely to be difficult.

As far back as 1924, Joseph Stalin had announced the fidelity of the U.S.S.R. to the Marxist-Leninist goal of bringing about the worldwide Communist International and had formulated a Soviet program of action. A series of Five-Year Plans to industrialize Russia came first. Then, in the 1930's, the Kremlin had "purged"—by exile, death, or political imprisonment—persons who "deviated" from the prescribed line of action.

The democratic West, divided into nations competing in the accepted capitalist pattern, had never formulated a corresponding system or worked out a program for its worldwide propagation. By its very nature, Democracy did not propose to force itself upon the rest of the world. American theory (fundamentally Jeffersonian and idealistic) holds that any nation, given the absence of tyranny, will in the course of nature become democratic. On Jan. 6, 1941, President Roosevelt had enunciated the "Four Freedoms" (*q.v.*) which he hoped would be realized "everywhere in the world" as an end-product of the war in progress. Later (Aug. 14, 1941), on a ship off Newfoundland, Roosevelt and Churchill had drawn up the Atlantic Charter (*q.v.*), which set forth, in idealistic terms, the war aims of the Western powers, including self-determination for all peoples. Even Stalin subscribed to this charter in September 1941; and two years later, when he needed Lend-Lease (*q.v.*) war supplies and was calling for the West to produce an effective second front, he dissolved (as it turned out, only temporarily) the Comintern, the world-revolutionary organization centering on Russia.

Yalta. The Russians, long suspicious of the West, feared that the democracies might like to see Russia and Germany simply destroy themselves against each other. To allay these suspicions, because Russian survival was deemed necessary to that of the West, President Roosevelt and Prime Minister Churchill conferred with Marshal Stalin at Yalta in the Crimea (February 1945) to work out a potential peace settlement. The Russians had suffered more than the Western Allies and some concessions seemed in order. Already the Red Army had conquered almost the whole of Central Europe and Communist agents were working diligently to establish, in a dozen nations, governments friendly to the Soviet Union. Stalin promised, however, that the peoples of Central Europe and the Baltic nations should have self-determination, to choose without intimidation at the polls the kinds of government they wanted. He also agreed to violate the Soviet nonaggression pact with Japan provided Russia could have a free hand in northeastern Asia; to this the Western leaders assented without consulting Chiang Kai-shek.

Wide World Photo

JAPANESE PEACE TREATY SIGNED

Shigeru Yoshida signs the treaty for Japan in San Francisco, Calif., Sept. 8, 1945

The United Nations. Already, at the Dumbarton Oaks Conference (Aug. 21-Sept. 17, 1944) and in 1945 at Yalta, the form of the United Nations (*q.v.*) was taking shape. It was to be a new League of Nations, slightly strengthened. Competitive nationalism being what it was, none of the Big Three nations was willing to make the new organization a world government with police power. Besides a permanent Secretariat, there were to be an assembly and a smaller Security Council including five permanent members (the

Big Three plus France and China). Major decisions would rest with the latter body. A rule was adopted calling for unanimity of the permanent members of the Security Council in all except procedural matters. Despite this veto power—which, as subsequently used by the Russians, became a serious stumbling block to world agreement—many peace-loving citizens of the democracies hoped that the new organization could become an effective force for peace. See also *United Nations.*

The Iron Curtain. The U.N. was not soon destined to be, as the democracies had hoped, a means of exposing the Soviet world to democratic ideas. Hardly had the ink dried upon the ratifying papers adopted by the 50 original members of the U.N. before an "Iron Curtain" was drawn down by Soviet Russia to insulate Central Europe from external influences of all sorts. The Comintern was reconstituted, and non-Russian Communists went once more about the work of undermining democratic ideals outside, and suppressing them inside, the Russian orbit.

Peace Treaties. "Winning the peace" involved also the making of peace treaties with the defeated Axis nations and their willing or unwilling collaborators. Stalin insisted that only Russia had the right to negotiate treaties with the semi-Nazified Eastern European nations and that the Soviet Union should have a veto power over any treaties made with other nations. When the Western countries demurred, Stalin proceeded nevertheless to draft peace treaties with Rumania, Bulgaria, Hungary, and Finland. Rumania ceded Bessarabia and northern Bukovina to the U.S.S.R. and southern Dobruja to Bulgaria and agreed to pay Russia $300,000,000 in reparations; she was somewhat compensated by seeing Hungary forced back into her prewar borders. Hungary agreed to pay Russia $200,000,000 and $50,000,000 each to Yugoslavia and Czechoslovakia. Bulgaria was to pay $45,000,000 to Greece and $25,000,000 to Yugoslavia. Finland gave up to Russia the Karelian Isthmus, the northern port city of Petsamo, and $300,000,000 in reparations. Karelia, Estonia, Latvia, and Lithuania were made into Soviet republics and incorporated into the U.S.S.R., a unilateral step which was not recognized by the U.S. government.

The Soviet Union had laid down the principle that actual military occupation should be the dominant factor in deciding who should dictate peace terms. On that principle, the Western democracies drew up the peace with Italy. In this the Russians acquiesced, perhaps because the withdrawal of occupation troops would leave political parties free to operate. The Russians continued for years to block peace settlements with Germany and Austria because of the presence of Western occupation troops, which prevented Communist political domination. Austria had to wait until 1955 before Russia would agree to a peace treaty, thus ending foreign occupation. Germany was split into the quasi-independent states of East Germany, aligned with the Soviet Union, and West Germany, aligned with the Western powers. Russia also refrained from making peace with Japan and tried to prevent the Western nations from doing so; but regarding these attitudes as mere obstructionism, the West made a separate peace with Japan in 1952.

The "Cold War." Once the actual fighting was over, the Western nations tended to relax, demobilize, and hope that the conquered nations would work back to normal conditions, with no pressures except economic aid. The Russians did just the opposite. By keeping armed forces in evidence, they succeeded in changing most of their adjacent states into Communist-dominated satellites; even the short-lived democratic republic of Czechoslovakia was forced into the Communist orbit. The Russians had agreed to the theory that the Danube and the Dardanelles should be open to general commerce; once in control of the Balkans, they promptly closed the Danube to Western shipping and attempted to apply pressure upon Turkey to secure preference for Soviet shipping in the Straits. The Communist rulers set up a variety of restrictions hindering relations between their satellites and Western Europe, and tried at intervals to squeeze the Western nations out of jointly occupied Berlin (a Western island within Russian-occupied Eastern Germany).

Although the Soviet Union was in the war against Japan for less than one week, that was enough time for Communist troops to move into Manchuria and northern Korea. The surrender of Japanese troops to the Russians, plus the agreements reached at Yalta and Potsdam, gave Russia the leverage needed in the Orient. Russia claimed from Japan the southern half of Sakhalin and the Kurile Islands (*qq.v.*), which she had lost in the Russo-Japanese War. Dairen was "internationalized"; Port Arthur became a Soviet naval base; and the Manchurian railroads were taken over by a Soviet-Chinese company. By way of reparations from Japan, and to keep such assets from falling into the hands of Chiang Kai-shek, the Russians cleared out all military supplies and numerous industrial installations (as they had also done in Poland and East Germany). Much of the war matériel eventually found its way into the hands of Mao Tze-tung and his Chinese Communists.

The Cold War began, both in Europe and Asia, almost as soon as physical conflict ended. It was a new historical phenomenon—psychological war on a vast scale. And the principal result of World War II was that the number of conflicting ideologies had been reduced from three to two. See also separate articles on nations, places, and persons mentioned in this article.

Worms (*wûrmz*), or VERMES, the lowest class of articulated animals, which are characterized by elongated, flattened, or cylindrical bodies. The name is loosely applied to a large number of forms that do not have many features in common, but some writers restrict the group to those that have a digestive tract with two openings, the mouth and the anus, and which have a blood-vascular circulatory system. In most forms the nervous system has a principal center above the throat, the body cavity is present, and the excretory organs are simple. The name worms is applied to many entozoa that are found in the intestines of the human body. These animal forms may occur at any period of life, but are most frequent in young children. They also occur in animals, sometimes seriously affecting the health.

Worms (*vōrms*), a city of Hesse, Germany, on the Rhine River. It is one of the oldest cities in Germany and its history is of much interest. Worms has manufactures of pottery, musical instruments, polished leather, tobacco products, wines, and machinery.

Worms, one of the most important cities of Germany during the Middle Ages, is extremely rich in monuments. Among them are the cathedral, a wonderful example of the Romanesque style, consecrated in 1110 and finished during the 13th century; the Church of St. Paul, also in 12th-century Romanesque style; and the Liebfrauenkirche in 15th-century Gothic style. The synagogue, one of the oldest in Europe, was originally erected in the 11th century and restored during the 13th century. The Jewish community in Worms, first mentioned in the 6th century A.D., became very influential around 1000. Large parts of the Jewish community left Worms for Poland during the Crusades, when they suffered severe persecution. For this reason, the Middle High German language, as it was spoken in Worms, is still preserved in "Yiddish." In another respect Worms plays a role in German history. Founded by the Romans, it became the center of a kingdom, about 400 A.D., which in 435 started fighting against the Romans. The latter called the Huns as allies and legends of this struggle became the main topic of the "Nibelungenlied" (*q.v.*). Several important diets convened at Worms, at one of which Luther appeared in defense of the Protestant faith before Charles V and the imperial princes. This event is commemorated by an imposing monument to Luther, unveiled in 1868. Following World War II the city came under French occupation. Population, *ca.* 50,000.

Wormwood (*wûrm'wŏŏd*), a class of plants which have an erect, angular, and shrubby stem and yellowish flowers. A number of widely diffused species have been catalogued, of which the *common wormwood* of Europe is the best known. This plant is now naturalized in Canada and the eastern part of the U.S. Its leaves are aromatic and yield a bitter tonic employed as a vermifuge and to protect clothing and furniture from moths and other insects. The *Roman wormwood* is native to Germany and has properties similar to those of the common wormwood. A tall greenhouse annual known as *wild wormwood* is native to the West Indies and is allied to the feverfew.

Worsted (*wûst'ĕd*), the name applied to several varieties of woolen yarn or thread, so named from Worsted, England, where it was first manufactured. A fine and soft worsted woolen yarn, untwisted or lightly twisted, is used in knitting and embroidery. Long-staple wool is employed to spin a well-twisted worsted yarn. This product is used in making gloves, carpets, hosiery, and cloth. Worsted goods of this class are produced largely from wool that has been combed carefully so that fibers lie parallel to each other.

Worth (*wûrth*), WILLIAM JENKINS, soldier, born in Hudson, N.Y., Mar. 1, 1794; died May 7, 1849. He distinguished himself in the War of 1812, was made captain in 1815, and commanded a department at the time of the insurrection on the border of Canada, in 1838. Later he fought against the Indians and in the Mexican War, and was prominent in the battles of Monterrey, Cerro Gordo, Chapultepec, and the City of Mexico. Congress presented him with a sword of honor for his services at Monterrey. A monument was erected to him at Broadway and Fifth Ave., New York.

Wound (*wōōnd*), the name applied to any incision, or puncture, in the fleshy part of the body, especially to an injury where the tissues are divided by mechanical force. Injuries of this kind are termed *penetrating*, when a cavity is cut into the body without passing through it, and *perforating*, when they form an opening through the body or through a particular part of it. Sharp-edged instruments cause wounds that are classed as *cuts* or *incisions*, while pointed weapons thrust into the body produce *stabs* or *punctured wounds*. Certain animal venom as well as poisonous matters produce *poisoned wounds*, while those caused by dull instruments are usually classed as *lacerated wounds*. Injuries resulting from gunshot are usually penetrating and sometimes lacerated.

Wounds may be said to have a local and a general effect. The local symptoms consist of pain, bleeding, and impairment of function, while the general effect includes a shock upon the nervous system and injury by excessive bleeding. Later other complications may set in, such as inflammation, gangrene, and bacterial infection.

The first object in the treatment of a wound should be to stop the bleeding, which may be done by bandaging so as to compress the vein or artery that has been opened. The next step is to wash the affected part with warm water. bathe with an antiseptic, such as a solution of boric acid, and then bandage with light cloth or gauze. It is necessary to disinfect and redress the wound from time to time, and it should be kept entirely free from foreign matter and impurities. Where the ruptured nerves and blood vessels remain in close contact, healing takes place rapidly by what is termed *primary adhesion,* or *first intention,* but when the edges of the wound are left apart the healing is by *secondary intention,* or *granulation.* The treatment of wounds has been considerably advanced by the experiences of the world wars. The chances of survival have increased greatly since the danger of infection, inflammation and gangrene has been greatly reduced. Among the preparations most generally administered are the sulfa drugs (*q.v.*) and penicillin (*q.v.*). The administering of blood plasma (*q.v.*) has also considerably cut down on deaths from wounds. See also *Surgery.*

Wrangel Island (*răn′gẹl ī′lạnd*), located in the East Siberian Sea, south of the Arctic Ocean, and 85 m. N.E. of Cape Billings, in eastern Siberia. It is separated from the mainland by Longa Strait, is 80 m. long by 30 m. wide, and has an area of about 2,000 sq. m. Berry Peak reaches a height of 2,500 ft., and the extremities have steep coasts. Tundra covers a large area. Polar bears, foxes, seals, walrus, and geese, ducks, and other birds are found. Pack ice surrounds the islands, but there are no glaciers.

Ferdinand von Wrangel sought to verify the existence of the island as early as 1824, but it was not until 1867 that an American whaling ship visited it and gave it its name. In 1881, Capt. R.M. Berry, U.S.N., explored the island. In 1924 Soviet Russia officially claimed the island and began colonization. Population, *ca.* 60.

Wrangler (*răng′glẽr*), the term applied to a student who attains the first class in the mathematical honor in examination in the Univ. of Cambridge, England. Any number of students may attain to the honor of wrangler, but the one who makes the best record is called the *senior wrangler.* The examination is public and the honors are commonly called *mathematical tripos.* The term is also applied in the American West to a cowboy charged with the management of horses; and, by extension, to one who deals with parties of paying guests; these latter are known as "dudes," and their conductor is therefore called a *dude wrangler.*

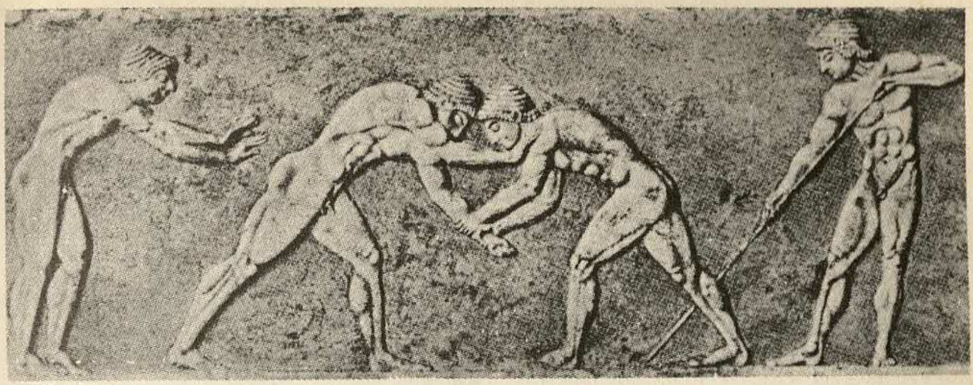
Wren (*rĕn*), the common name of several kinds of small birds related to the warblers. Most species are native to America, and they are also found in abundance in the Old World. The *house wren* of Canada and the U.S. builds its nest near houses and in boxes placed for it in house yards. It is about 5 in. long with a wingspread of 10 in., has a reddish-brown color with whitish markings below, and has great valor in defending its nest against other birds. Two broods of young are reared in a season. This species of wren is a very common kind of bird and has a beautiful song. Other familiar species include the *marsh wren, winter wren,* and *Carolina wren.* The common European wren is somewhat smaller, being about 4 in. long, and with the exception of the golden-crested wren is the smallest bird in Europe. Nearly all the wrens have a slender bill, short wings, and a short and erect tail.

Wren, SIR CHRISTOPHER, architect and mathematician, born in 1632; died in 1723. After teaching astronomy at Gresham Coll., London (1657-61), he became Savilian professor of astronomy at Oxford Univ. Wren is remembered today principally as an architect, but in his lifetime he was honored as a great mathematician. His only course of study in the architectural field was a stay of six months in Paris, during which he watched construction of the Louvre. After London was swept by fire in 1666, he submitted a highly original and masterly scheme for reconstruction of the city. This was rejected, but Wren designed plans for many new buildings, of which St. Paul's Cathedral is the most noble example. In the ensuing years, Wren executed designs for more than 50 London churches, many of which are standing today, including St. Stephen, Ludgate, Fleet Street, Marylebone, etc. Other buildings for which Wren was the architect are the Sheldonian Theater and Queen's Coll. Library, Oxford; Trinity Coll. Library, Cambridge; Chelsea Hospital, etc., as well as many private homes, both in London and the country. All bear the Wren stamp of dignity combined with startling originality and vigor. The fine spires of his churches are par-

CHRISTOPHER WREN

Painting by Godfrey Kneller (1646-1723)

Courtesy British Information Services, N. Y.



WRESTLING

Greek relief, *ca.* 500 B.C.

ticularly noted. Charles II knighted the architect in 1673. He was buried at St. Paul's, where his tomb bears the inscription *Si monumentum requiris, circumspice* (If you seek his monument, look about you).

Wren, PERCIVAL CHRISTOPHER, soldier and author, born in Devonshire, England, in 1885; died in Amberley, Gloucestershire, Nov. 23, 1941. Educated at Oxford, he traveled in Africa and Asia, served in the British cavalry, and was a member of the French Foreign Legion. This latter experience provided the background for his most famous work, "Beau Geste" (1924, later translated to stage and screen plays), as well as such other novels as "Soldiers of Misfortune" (1929), "Valiant Dust" (1932), and "Cardboard Castle" (1938).

Wrestling (*rĕs′lĭng*), an athletic contest between two persons, each of whom endeavors to force his antagonist to the ground without resorting to kicks or blows. It is one of the most universal of athletic activities and is a trial of both skill and strength. The Greeks encouraged wrestling as a gymnastic exercise; in the Isthmian, Nemean, and Olympic games the wrestling victors received the highest honors. Wrestling also was cultivated by the Romans, but their contests were savage and brutalizing fights, rather than fair tests of wrestling skill. Wrestling contests depicted in ancient Egyptian sculptures make it evident that such contests were practiced at a very early date. The ancient wrestler was almost nude, and his body was covered with oil. This made it difficult for the contestants to get a firm grip, and they were permitted to use sand on their hands. They seized each other by the arms, employed many contortions of the body, interlocked their limbs, and used various holds to force the opponent to the ground.

In the U.S., modern amateur wrestling has developed into a popular sport, governed by definite systems of rules, which may, however, vary in different localities. The American, or free-style, system (sometimes called "catch-as-catch-can") limits a contest to 9 min., divided into three periods. All wrestling takes place on a mat, 24 ft. by 24 ft. in size. No ropes are used. The object of a contest is to defeat an opponent by either a fall or a decision. A fall is defined as the touching of the two shoulders to the mat for 2 sec. A decision is awarded by the officials on the basis of the aggressive tactics used by the competitors. Two points are awarded for each *go-behind* or *take-down; i.e.,* taking an opponent off his feet, bringing him to the mat, and gaining control. Two points are awarded for each *reversal of position; i.e.,* coming from the underneath, or defensive, position to the top, or control, position. One point is given for each escape from the defensive position; two points for a near fall; and one point for each minute a contestant remains in the control position, with a limit of two points in a bout.

College and Amateur Athletic Union teams include eight weight classes. The Olympic rules differ somewhat from the American rules; for instance, a fall requires only the touching of both shoulders to the mat, without regard to the time element.

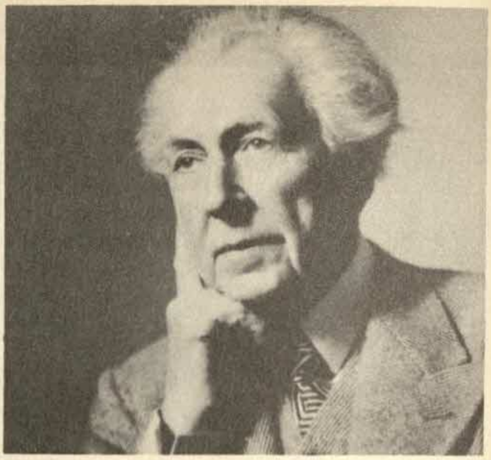
Professional wrestling is, for the most part, not a sport. A professional wrestling "match" is usually an exhibition intended for the entertainment of an audience.

Wright (*rīt*), SIR ALMROTH EDWARD, bacteriologist and physician, born in Middleton Tyas, Yorkshire, England, Aug. 10, 1861; died in Farnham Common, Buckinghamshire, April 30, 1947. After graduation from Dublin Univ., he studied in Germany. He taught pathology at Cambridge Univ., 1887-89, lectured in physiology at Sydney Univ., 1889-91, was professor of pathology in the army medical school at Netley, 1892-1902, and was professor of experimental pathology at the Univ. of London and head of pathology research at St. Mary's Hospital in London, 1902-46. He was knighted in 1906. A Fellow of the Royal Society of Medicine, he was a member of other scientific organizations. During World War I he was a consulting physician to the English army in France. He received the Royal Society's Gold Medal (1920) and other awards.

The researches into parasitic diseases which made him famous were begun at the turn of the century. He introduced antityphoid inoculation and was a pioneer in preparing vaccines and in devising methods for measuring protective substances in human blood. Among his published treatises were "System of Antityphoid Inoculation," "Principles of Microscopy," "Studies in Immunization," and "Treatment of War Wounds."

Wright, CARROLL DAVIDSON, statistician and sociologist, born in Dunbarton, N.H., July 25, 1840; died Feb. 20, 1909. In 1860 he began to study law, but enlisted in the New Hampshire volunteer regiment in the Civil War, becoming a colonel in 1864. He was admitted to the bar after the cessation of hostilities, and during 1872-73 he served as a member of the Massachusetts senate. From 1873-78 he was chief of the Massachusetts Bureau of Labor, becoming U.S. commissioner of labor from 1885 to 1905. In 1893 he was placed in charge of the 11th census, and in 1894 he was chairman of the commission to investigate the Chicago railway strike. In 1902 he was made president of Clark Univ., Worcester, Mass. His publications include "Convict Labor," "Factory System of the U.S.," "Relations of Economic Conditions to the Causes of Crime," "Strikes and Lockouts," "Relation of Political Economy to the Labor Question," "Scientific Basis of Tariff Legislation," and "Hand Labor in Prisons."

Wright, FRANK LLOYD, architect, born in Richland Center, Wis., June 8, 1869; died in Phoenix, Ariz., April 9, 1959. After studying at the Univ. of Wisconsin, he was trained in Chicago by Louis Sullivan, architect of early skyscrapers. Denouncing the skyscraper and cities of steel and stone, Wright formulated the theory that form in architecture must follow function and, in 1894, opened his own office in Oak Park, Ill. Illustrating his thesis were the low, land-hugging buildings constructed out of native rock or other materials that came to be known as "prairie architecture." Some of his outstanding structures are the Larkin Soap Factory (1903), Buffalo, N.Y.; Oak Park Unity Temple (1904); "Robie House" (1909), Oak Park; the Johnson's Wax Co. buildings (1936-39), Racine, Wis.; "Falling Waters" (1937-39), Bear Run, Pa., a house which was cantilevered over the surrounding rocks and waterfall; and his own home, "Taliesin" (1911), at Spring Green, Wis. He designed the Imperial Hotel (1916-20), Tokyo, Japan, to withstand earthquakes, and after the severe quake of 1923 it was the only large building in the city left standing. One of his latest works was his only New York City commission, the cylindrical Guggenheim Museum (1956-59).



Courtesy Carlyle Studios, N. Y.

FRANK LLOYD WRIGHT

Receiving recognition first in Europe, Wright is considered one of the greatest modern architects. He established (1932) the Taliesin Fellowship, under which he annually trained 40 or more apprentice architects, who lived with him at "Taliesin" and at "Taliesin West," in Phoenix. Some of his many books are "Modern Architecture" (1931), "An Autobiography" (1932), "An American Architecture" (1955), "A Testament" (1957), and "The Living City" (1958). See also *Architecture*.

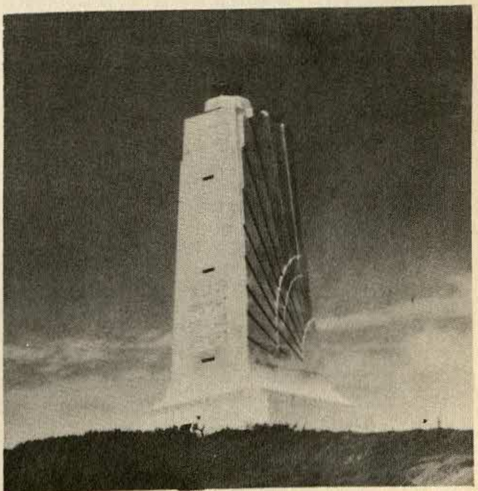
Wright, HAROLD BELL, novelist, born in Rome, N.Y., May 4, 1872; died in La Jolla, Calif., May 24, 1944. Wright attended the preparatory department of Hiram Coll., Hiram, Ohio, for two years, until an illness caused him to end his schooling; it was his only formal education. His interest in backwoods people led him to Missouri, and, after settling near Lebanon, he was persuaded to substitute for an absent minister in a rural church. Despite his lack of seminary training, for the next ten years he was pastor of various churches in the region. In 1903, while serving as minister of the Forest Ave. Baptist Church, Kansas City, Mo., he began writing his first book, "That Printer of Udell's," a study of church conditions, and read it, chapter by chapter, to his congregation. It was received with such enthusiasm that he offered it for publication. Five years later he gave up preaching, moved to El Centro, Calif., and devoted himself to writing. He wrote 19 books, most of them on timely social problems, and literary historians have attributed his great success to the timeliness of his topics rather than to his writing talent. His two most successful novels were "The Shepherd of the Hills" (1907) and "The Winning of Barbara Worth" (1911); more than 2,000,000 copies of each had been sold when he died. Other widely read novels of his were "The Calling of Dan Matthews," "God and the Groceryman," "The Re-Creation of Brian Kent," and "Helen of the Old House." It was estimated that sales of his first 12 novels totaled 10,000,000 copies. He was temporarily incapacitated, following an accident in Arizona in 1916, but persisted in writing at the hospital. His last published novel was "The Man Who Went Away" (1942).

Wright, HORATIO GOUVERNEUR, soldier, born at Clinton, Conn., Mar. 6, 1820; died July 2, 1899. He was graduated from West Point in 1841, served as an engineer for six years, and held an official position at Washington until the beginning of the Civil War, when he was made a brigadier general in charge of volunteers. The following year he commanded the forces which captured the Florida coastal and river cities, and in 1863 he took command of the department of Ohio, serving in the Wilderness campaign of 1864. In the same year he was made a major general, shortly thereafter repulsing Gen. Jubal A. Early in his drive on Washington. He served under Gen. Sheridan in the Shenandoah Valley and commanded the first troops to enter the Confederate works at Petersburg. He was made chief of engineers in 1879, retiring from active service in 1884.

Wright, JOSEPH, artist, born at Bordentown, N.J., in 1756; died in 1793. He began the study of art under his mother, Patience Wright, who was known for her wax modeling of the heads of notables, and who also is said to have been a secret American agent in Europe during the American Revolution. About 1772, after her husband died, she took her son to London, where he studied painting under Benjamin West. He first exhibited at the Royal Acad. in 1780, showing a portrait of his mother. Later he painted the portrait of the Prince of Wales, later King George IV. The family moved in 1782 to Paris, where Joseph Wright painted portraits of many women of fashion. Through his mother he was acquainted with Benjamin Franklin, who gave him a letter of introduction to George Washington. Returning to America, in 1783 he painted George Washington at the latter's headquarters near Princeton, N.J. He executed another portrait of Washington the following year, for a French nobleman's collection, and also did heads of John Jay and Madison. In 1790 he made an etching from a crayon drawing of Washington. Prints of the etching were widely circulated, bringing him recognition as an etcher, although no other etchings have been definitely attributed to him. When the U.S. Mint was established at Philadelphia in 1792 he was appointed as first draftsman and diemaker. The first coins struck by the government are believed to have been his work, and the first medal bearing the head of Washington is said to have been drawn by him. He and his wife died at Philadelphia during the yellow fever epidemic in the fall of 1793.

Wright, LUKE E., public official, born in Memphis, Tenn., in 1847; died Nov. 17, 1922. He studied under private tutors and was admitted to the bar at Memphis. His public career included the following important appointments: member of the commission to establish civil government in the Philippines (1900), acting governor (1902), and governor of the Philippines (1903). He was the first U.S. ambassador to Japan (1906-07), and Secretary of War under Theodore Roosevelt.

Wright, ORVILLE and WILBUR, pioneers in aviation and aircraft design. Orville was born in Dayton, Ohio, Aug. 19, 1871; died there Jan. 30, 1948. Wilbur was born in Millville, Ind., April 16, 1867; died in Dayton, May 30, 1912. Sons of a bishop of the United Brethren Church, the Wrights attended high school and in 1892 opened a bicycle shop, where they soon began building their own vehicles. Meanwhile such aviation pioneers as Otto Lilienthal, S. P. Langley (*qq.v.*), and Octave Chanute were developing theories and demonstrating craft for human flight. Accounts of and by such men excited the interest of the Wright brothers, who began to experiment on their own after 1896. Their first aircraft model, built by Wilbur in 1899, was a biplane design with a 5-ft. wingspan, which they flew as a kite. In 1900 they selected Kill Devil Hill, near Kitty Hawk, N.C., as a testing ground for their models. Orville devised (1901) a wind tunnel with which they recalculated erroneous data then used in aircraft design to determine drag, lift, and center of pressure. With this more accurate data, they developed an



Courtesy North Carolina Dept. of Conservation & Development

WRIGHT MEMORIAL AT KITTY HAWK, N.C.

improved glider which they tested in 1902, making flights of more than 600 ft. Their first powered craft was flown successfully on Dec. 17, 1903, when Orville made a flight of 120 ft., remaining aloft for 12 sec. Wilbur bested this record the same day by flying 852 ft. in 59 sec. After further improvements had greatly lengthened the time and distance of flight, the brothers obtained their first patent (1906). In 1908 Wilbur, flying in France, and Orville, demonstrating a plane built under U.S. government contract, made record-breaking flights which brought them world-wide fame. In 1909 they formed the American Wright Co. to manufacture planes; the firm passed to other hands in 1915 when Orville (after Wilbur's death) sold his interest in it. The first Wright plane, displayed in England after 1928, was placed in the Smithsonian Institution, Washington, D.C., in 1948. See also *Aviation*.

RICHARD WRIGHT

Wright, RICHARD, writer, born near Natchez, Miss., Sept. 4, 1908; died in Paris, France, Nov. 28, 1960. He was educated in a church school where he lived for a while and where his aunt was a teacher. Striking out on his own at the age of 15, Wright worked at numerous jobs before gaining recognition as a writer. After winning a prize for his novelette, "Uncle Tom's Children" (1938), he received a Guggenheim fellowship and used it to write "Native Son" (1940), a best seller. His other works include "Black Boy" (1945), "The Outsider" (1953), "The Color Curtain" (1956), "White Man, Listen!" (1957), and "The Long Dream" (1958).

Wright, WILLARD HUNTINGTON, writer, born in Charlottesville, Va., in 1888; died in 1939. Educated at Pomona Coll., California, and at Harvard Univ., he entered journalism in 1907 and became a literary and art critic on such well-known publications as *The Forum* and Hearst's *International Magazine*. However, he is best known by his pseudonym, *S.S. Van Dine*, under which he created the famous detective figure, Philo Vance, featured in his novels, "The Canary Murder Case" (1927), "The Bishop Murder Case" (1929), "The Powwow Murder Case" (1938), etc.

Wrist (*rĭst*), in anatomy, the joint which connects the forearm with the hand. It is composed of eight little bones, the *carpal* bones.

Writ (*rĭt*), a written order issued by the authority of a state or province, requiring a person to do something mentioned in the order. Such a document is issued by a court or some other official and the person commanded to act is required to appear at the time or place mentioned, or do whatever may be directed. A writ is issued under the seal of a public official and it is served, or executed, by the sheriff or some other similar officer. A *writ of mandamus* commands a person or inferior court to do a duty or fulfill an obligation; of *injunction*, restrains action; of *error*, requires the removal of a cause from a lower to a higher court to correct an error; of *subpoena*, commands the attendance of a witness; of *ejectment*, removes an occupant from certain premises; of *replevin*, permits the recovery of goods taken illegally; of *certiorari*, requires the record of a cause to be sent for review from an inferior to a higher court for examination; of *quo warranto*, requires an official to show by what right an office is held or an act is done; of *attachment*, directs taking property into custody by virtue of a legal process; and of *habeas corpus*, has for its object to bring a party before a court or judge, usually to inquire into the cause of a person's imprisonment.

Writer's Cramp (*rīt'ẽrz ḳrămp*). See *Paralysis*.

Writing (*rīt'ĭng*). All investigations into the origins of reading and writing lead to the belief in primitive man's having made extensive, as well as expert, use of the gesture-language. In his study of modern savages the student is confronted with a similar situation. Gesture-language is essentially a drawing in the air. The step forward from such practice to writing in the sand, or on stone and wood, should not necessarily be looked upon as anything but normal development of the process of expressing ideas to others at hand or at a distance, or for future records. This age is usually referred to as the pictograph stage in the history of writing as well as of reading, since the development of both is so closely interwoven.

Although the date of its appearance cannot be accurately stated, there seems to be sufficient evidence to indicate that the Babylonians of 8,000 years ago had progressed much beyond this type of writing. At first the pictures were sketches of objects within the environment and were significant. As time moved on and certain segments of the human race advanced beyond others, because of the increasing complexity of their particular form of civilization, there began to be expressed, pictorially, ideas and feelings. Such ideographs became conventionalized. As the needs of an advancing civilization extended, the exclusive use of picture-writing became inadequate. The spoken language kept apace of these needs and the search began "for graphs which would represent to the eye the sounds of these spoken languages, as sounds" (Huey). The rebus-phonogram stage then appeared; we still enjoy the examples of this which we come upon, not infrequently, in some present-day books and newspapers.

Among the ancient systems of writing which finally reached the alphabetic level we find the Egyptian hieroglyphics. The hieroglyphics were characters, stemming directly from picture-writing, which the Egyptians used for inscriptions on monuments and for sacred purposes. They literally covered their monuments with them. Some 5,000 years before our era these people had passed through the stages of writing enumerated above, although for years, not realizing the full significance or utility of their discovery, they continued to use—"along with words properly indicated with letters, both syllabic signs and ideographs—the outcome being a very cumbersome system of writing" (Smith). Further simplification led to the introduction of hieratic characters which were used in copying literary manuscripts. About 900 B.C. there appeared the demotic writing, which soon became the popular form. During Napoleon's campaign in Egypt the famous Rosetta Stone (*q.v.*) was found near one of the mouths of the Nile. This contained a royal decree written in three kinds of characters, *viz.*, hieroglyphics, demotic, and Greek, which latter all scholars knew. Scholars correctly inferred that the Greek was a translation of the demotic and the hieroglyphics. It was in this way that the science of Egyptology was introduced.

Thousands of years of effort to communicate at last produced the alphabet, which has seemingly "solved for all time the problem of facile communication, in writing, of all that man had to communicate" (Huey). It is commonplace for each of us to realize how the arrangement and rearrangement of these twenty-six characters can represent to the eye all that men have said or may say.

Handwriting is an important subject in the curriculum of our elementary schools. It is assumed that all who have ideas or information are desirous, when occasion demands, of communicating them to others in writing. It is useful, consequently, that each be able to do so. The school, from its beginnings, has taken upon itself the task of training children in this skill. Until about 50 years ago little of what might be termed "special method" was applied to its teaching. The prevailing practice was careful imitation of model forms at the top of each page of the copybook. Research in the field of child development brought to light many significant factors which have influenced handwriting instruction. Findings relative to maturation, for example, indicated that the writing of beginning children should be large, the size being gradually reduced up the grades, in this way not forcing the accessory muscles into play beyond the point of maturation. This is but one of the numerous findings resulting from the search for proper methods of instruction. It might not be amiss to mention in some detail the procedure which, if followed faithfully, has been found to result in normally good handwriting.

Position at the desk is very important from the standpoint both of good writing and the health of the growing child. Assuming that the desk and the seat are of proper height, the writer should face the desk squarely. The feet should rest flat on the floor, the body inclining slightly forward from the hips, the back being held straight. The forearms, resting on the desk, "should be inclined toward one another so that the hands are near together" (Freeman and Dougherty). The left hand should be used to move the paper, both upward and to the left when necessary. The grasp of the pen should be light, the thumb pressing it gently against the second finger while the first finger rests on the top. The Penmanship Syllabus for the Schools of New York City recommends that the point of the pen be at least one inch from the end of the first finger and the paper so placed that the forearm crosses the ruled lines of the paper at right angles. For the naturally left-handed child the position of the paper should be reversed in such manner that the left arm crosses the ruled lines at right angles. It is quite obvious that correct school furniture and a correct study space for the child when he writes at home are essential to the attainment of these requirements. The one-armed chairs to be found in some schools are especially to be deprecated. Correct writing position and writing movement are almost impossible with such furniture.

The question of handedness deserves a few words by way of caution. Right- and left-handedness, according to the evidence, are inborn. One authority states that approximately five or six per cent are more skillful in the use of the left hand and seemingly prefer to use it in writing (Giesecke). Since the naturally left-handed should be taught to write with the left hand, it is important that parents and teachers be aware of the simple tests which may be used to determine the condition. Careful observation of the youngster during his various activities—*e.g.*, use of knife and fork, throwing ball, buttoning clothes, threading needle, using scissors—give reasonably certain indications. Where there is uncertainty and it seems that the child is but slightly left-handed, he might be urged to write with the right hand. A small, readable pamphlet by Dr. Frank N. Freeman on this matter would be helpful for both parents and teachers of children beginning school. ("Solving Handwriting Needs," Zaner-Bloser Co., Columbus, O.). If one-arm chairs must be used in schools, then certainly some left-handed chairs should be provided for naturally left-handed pupils.

Legibility, the ultimate aim of instruction in penmanship, is best realized through emphasis upon position, proper movement, speed, and, finally, form. Insistence upon legibility from the outset will not produce good results in the majority of cases. The writing is produced by a coordination of movements involving the arm, hand, and fingers. In the first school year and thereafter it is well to develop the habit of correct position at the desk. In the second year conscious attention to movement should be added, but ordinarily form is not focused upon until the third and, in some systems, the fourth school year.

The periods of drill and practice should be short and frequent. Longer periods than 10 to 15 minutes per day have been found to be ill-advised. Meticulous attention to the removal of specific weaknesses brings about steady improvement. Formation of proper habits is essential in the development of any skill. All that has been said about position, etc., in regular penmanship lessons applies equally to all situations in which the skill functions.

Manuscript or print writing is now commonly taught, particularly in the first two years wherein it is considered the preferred form because it is more readily mastered by small children than the regular cursive writing. There is substantial agreement that it helps the child in his learning of reading and spelling. Though introduced into this country as late as 1920, a recent survey by Freeman shows that more than 84 per cent of the cities and towns of the country are using it. In most instances the pupils begin to learn cursive writing in the third year.

The necessity for guidance in evaluating the handwriting of the children as they move up the grades led educators to construct scales which might be of service in measuring adequately the results of teaching in this field. The facility with which a specimen of writing can be read is an important factor. Because of this many have attempted, and with reasonable success, to produce a measuring instrument which might help the teacher in judging the results of her instruction as well as point the way to improvement. The following brief remarks on some of the scales now in use is not meant to imply that they are perfect measuring instruments. Each has its own strong points and weaknesses; concerning each, opinions of value will differ. Each scale contains specimens of handwriting known, from careful investigation, to be average for the various grades and ages. The specimen of the child's writing is compared with the various specimens on the scale. The one which most closely approximates the product of the child's work indicates his level of attainment. The mark thus assigned is referred to the table of norms on the scale and this shows the grade and age of the child in so far as achievement in penmanship is concerned.

The *Thorndike Scale* represents a pioneer effort to render objective the measurement of legibility and beauty in handwriting. A short time later the *Ayres Scales* appeared, of which the Gettysburg Edition came to be the most commonly used. This likewise measured general merit. Each had norms as well for speed. Further intensive, skilled and patient research led to the development of more refined scales which diagnosed specific weaknesses and indicated procedures for remedial work.

Among these latter the *New York City Penmanship Scale,* which measures form, spacing, movement, and speed, is very widely known and used by teachers. The *Freeman Handwriting Scale,* measuring five specific elements in handwriting, is also widely used. *West's American Handwriting Scale,* which has the added feature of ascribing percentage marks to each specimen rather than quality marks, is a comparatively recent addition to this list.

In the field of manuscript writing a very useful scale, constructed by Frank N. Freeman and the Zaner-Bloser staff for measurement in Grade I and Grade II, is widely used. Edith U. Conard has devised two scales for judging the quality of manuscript writing—the one for scoring pencil writing, the other for scoring pen writing which is usually begun in the second or beginning of the third year. See also *Penmanship.*

Writing Off (*rīt′ĭng ôf*), in bookkeeping, the closing or canceling of an account by transferring the balance of a debt to the debit of profit and loss accounts, as a bad or uncollectable debt.

Writing Paper (*rīt′ĭng pā′pẽr*). See *Paper.*

Writs of Assistance (*rĭts of ȧ-sĭs′tạns*), warrants issued by the courts of revenue officers to enforce the navigation and revenue laws in the American colonies. Parliament passed an act providing for these writs, in 1754, and they were further legalized in 1766. They differed from an ordinary search warrant in that they were not limited as to time for making an inspection of the premises for goods, and it was not required to specify the premises where search was to be made. The colonists objected violently, since the general terms of the warrants made it possible to abuse the liberty of the subjects. James Otis argued against such writs before the superior court of Massachusetts in 1761, but they were held to be legal. Subsequently they were rarely issued.

Wroclaw (*vrô′tsläf*). See *Breslau.*

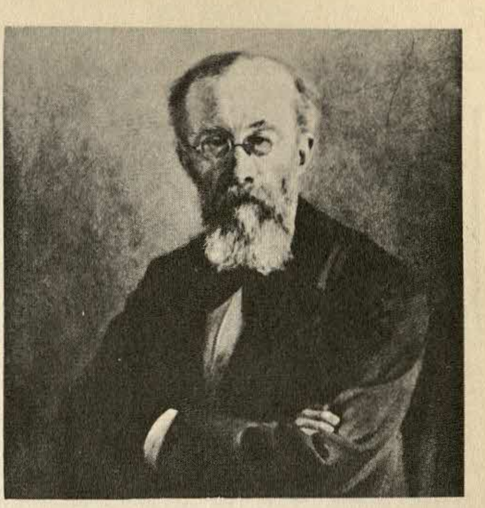
Wryneck (*rī′nĕk*), a small bird (genus *Jynx*) of the woodpecker family, so called from its habit of twisting its head and neck. The body, about 7 in. long, is a rusty gray in color, marked with irregular spots of brown and black. The common wryneck of Europe is migratory, moving as far north as Great Britain and Russia in spring. Several species are found in Africa. The wryneck feeds on ants and other insects.

Wuchang (*wōō′chăng′*), a city in east central China, capital of Hupeh Province. It is located on the Yangtze River at the mouth of the Han River, across from Hanyang and Hankow, with which it forms the metropolitan area called Wuhan. It has two universities and is also the site of a government mint. Its industries include cotton and silk weaving, tanning, paper manufacture, and food processing. The city was founded in the 3rd century A.D. Population, *ca.* 200,000.

Wu-hsien (*wōō′shĭ-ĕn′*). See *Soochow.*

Wundt (*vŏŏnt*), WILHELM, sociologist and philosopher, born at Neckarau, Germany, Aug. 16, 1832; died Aug. 31, 1920, near Leipzig. He was educated at Heidelberg, Tübingen, and Berlin, received degrees in law and medicine, and in 1857 became teacher of physiology at Heidelberg. In 1874 he was made professor of philosophy at Zurich and later held a similar position at Leipzig, where he founded the first psychological laboratory in 1879. He may actually be regarded as the first modern experimental psychologist.

Wundt belongs, like Helmholtz and Johannes Muller (*qq.v*), with those natural scientists who tried to combine research in natural science with philosophical and especially with epistemological considerations. His "Principles of Physiological Psychology" (1887) and his essay, "On the Influence of Philosophy Upon the Empirical Sciences," are still important documents for the study of philosophy and psychology. His "System of Philosophy" (1889) tries to draw philosophical conclusions from his physiology. The combination of exact physiological measurements with psychological analysis of the relationship between stimulus and response is characteristic of Wundt. He proved that physiological facts and psychological phenomena corresponded completely with each other. His "Psychology of Peoples" (1900-20) opened new horizons with its psychological approach toward anthropological, ethnographical, and even historical problems. His other works include "Theory of the Movement of the Muscles," "Lectures in Human and Animal Psychology," "An Investigation of the Facts and Laws of the Moral Life," "Outline of Psychology," and "Popular Psychology."



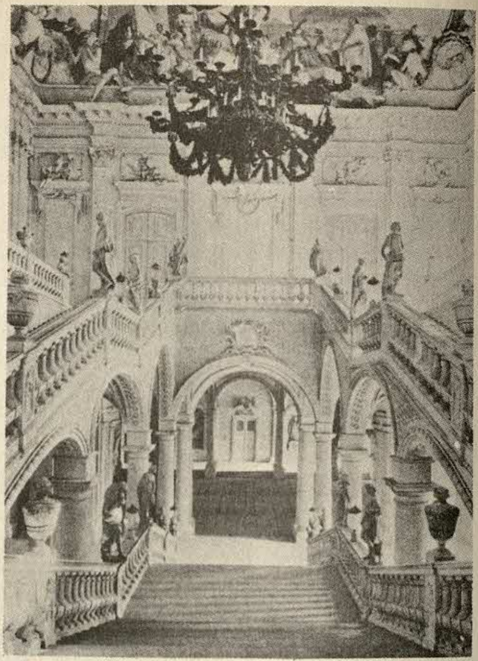
WILHELM WUNDT

Wuppertal (*vŏŏp′ĕr-täl*), a city in Germany, in the *Land* of North Rhine-Westphalia, on the Wupper River, 16 m. N.E. of Düsseldorf. Located in the highly industrialized Ruhr valley, it is a major manufacturing center, its products including textiles (particularly synthetics), chemicals, rubber and metal products, furniture, carpets, machinery, paper, glass, and firearms. Wuppertal was formed (1929) by a consolidation of several old cities, including Barmen, Elberfeld, and Ronsdorf. Barmen, which dates from the 12th century, became a town under French rule in 1808. It was annexed by Prussia in 1815, and it developed as an industrial center early in the 19th century. It is the site of mineral springs and spa facilities. Elberfeld, also dating to the 12th century, was originally a colony of weavers. It was incorporated as a town in 1610 and became an industrial center late in the 18th century. Elberfeld is noted for its system of relief to the poor, which was adopted in 1852 and incorporated many of the features of modern social work. As the seat of the I. G. Farben chemical industry, Wuppertal was half ruined in World War II, but it has been largely rebuilt. Population, 1957, 411,231.

Württemberg (*vürt′tĕm-bĕrg*), formerly a state in southern Germany, lying between Hohenzollern, Baden, and Bavaria, and separated from Switzerland by Lake Constance. Württemberg was 138 m. long, 106 m. wide, and had an area of 7,535 sq. m. It is chiefly an agricultural region. About two-thirds of the entire area is under cultivation, and fully three-tenths is covered with forest. Ranges of the Alps cross the southern part, and in the interior are the Hohenstaufen Hills. It has fine forests of pine, oak, beech, and other valuable timber. The mineral deposits include gypsum, copper, coal, iron, bismuth, cobalt, limestone, salt, and granite. The temperate climate is highly favorable to the cultivation of cereals and fruits and is exceptionally healthful. Wheat, corn, rye, hay, barley, hops, tobacco, and vegetables are the principal crops. The vineyards yield large quantities of excellent grapes, which are made into Rhine and champagne wines. Livestock of all kinds is abundant, especially milch cows, horses, cattle, and swine. The manufactures include ironware, clothing, woolen and silk textiles, beet sugar, liquors, chemicals, scientific instruments, and machinery. Navigation facilities are provided by several canals in connection with the Danube and Neckar Rivers, and extensive railroad facilities are maintained in all parts of the country. The chief cities include Stuttgart, Ulm, Heilbronn, and Esslingen. Among its educational institutions, the Univ. of Tübingen, founded in 1477, is one of the most famous of Europe, and the Polytechnic School at Stuttgart is also well known. The inhabitants are largely Protestant.

The earliest inhabitants of Württemberg probably were Celtic, but the Suevi occupied the country at the time of the Roman conquest, and in the period of the decline of Rome it was overrun by the Alemanni and the Franks. Conrad, Count of Württemberg, possessed a small territory in 1090, but his successors added considerably to their possessions, especially Ulrich I, who governed the country from 1246 to 1265. It was established as a dukedom in 1495 by Emperor Maximilian, who conferred upon the reigning duke the title of Eberhard I. In 1805 it became a kingdom as a result of the aid which Duke Frederick II gave to Napoleon. His son, William I (1781-1864), reigned for 50 years, giving the people a liberal and progressive government. The kingdom joined the German Empire in 1871 and became a part of the German Republic in 1918. Stuttgart is the capital and largest city.

Württemberg was the scene of heavy fighting during World War II. It was invaded for the first time in early April of 1945 by the U.S. Seventh Army and the French First Army. By the end of April, the allied armies had completed their eastward sweep across the state. At the termination of the war, the northern half of the state fell into the American Zone of Occupation and the southern half became a part of the French Zone of Occupation. Population, *ca.* 3,000,000.



WÜRZBURG. STAIRCASE OF THE RESIDENCE

The Residence was designed by Balthasar Neumann (1687-1753), a leading architect of the German Baroque period

Würzburg (*vürts'bōōrg*), a city of Germany, in the northwestern part of Bavaria, 60 m. S.E. of Frankfort-on-the-Main. It is admirably situated on the Main River, which is crossed by a number of substantial bridges. It has extensive railroad facilities. The famous Univ. of Würzburg was founded in 1582. It is renowned for its college of medicine. Würzburg is foremost among the "Baroque" cities of Germany, *i.e.*, those which (like Munich, Dresden, and Bayreuth) were decisively shaped by the architectural style of the time from 1680 to 1780. The widely imitated style of Versailles (*q.v.*) is here reflected in one of Germany's most beautiful castles, the "Residence," with remarkable landscaped gardens. Numerous churches, including St. Peter's Church, Neumünster Church, Schönborn Chapel, and Stift Haug, were built during the same period. These churches and many private houses are all characterized by the rich ornamental style of the German Baroque. Among the manufactures are cotton and woolen textiles, leather, glassware, railroad cars, machinery, and farming implements.

A battle occurred between the Prussians and Austrians near Würzburg in 1866. During World War II Würzburg was the scene of heavy fighting. On Apr. 4, 1945, the city fell to the U.S. Third Army, led by Gen. George S. Patton, Jr. At the termination of the war, it was included in the American Zone of Occupation. Population, *ca.* 100,000.

Wuthering Heights (*wŭTH'ẽr-ĭng hīts'*), novel by Emily Brontë (*q.v.*), published (1846) under the pen name Ellis Bell.

Wu Ting Fang (*wōō tĭng fäng'*), diplomat and statesman, born at Singapore, in the Straits Settlements, in 1842; died in 1922. He was enrolled in St. Paul's Coll., Hong Kong, in 1855, where he studied for five years, and subsequently became interpreter in the British law courts. Afterward he studied law at Lincoln's Inn, London, and was admitted to the bar and practiced his profession at Hong Kong. The government of China placed him on the official staff of Li Hung Chang in 1882, and he served on the commission that negotiated the Treaty of Shimonoseki. In 1896 he was made minister to the U.S. and became prominent as an opponent of the Chinese exclusion act. The Chinese government recalled him in 1902 and made him commissioner to aid in negotiating treaties with foreign countries. He was made vice president of the board of commerce in 1903, and exercised a wide influence in opposition to the Chinese boycott of American products in 1905. The following year he began to advocate the adoption of the jury system in China. He served as minister to the U.S. from 1896-1902 and again from 1908 to 1909.

Wyandots (*wī-ạn-dŏts′*), a North American Indian tribe of the Iroquois family. They first came in contact with the whites in the vicinity of Lake Huron, where they engaged in the culture of tobacco, from which circumstance they were for some years called the Tobacco Indians. The Iroquois nearly exterminated them in 1636 and the surviving remnant settled in the vicinity of Detroit, Mich. In 1812, 400 Wyandots sided with the English. Subsequently they sold their lands to the U.S., some of them moving to Canada and others to Kansas. At present they number about 800, of whom about 100 are in Ontario, 350 in Oklahoma, and 400 in Quebec.

Wyandotte (*wī′ạn-dŏt*), a breed of domestic fowls, comprising five varieties, all differing in plumage.

Wyandotte, a city in Wayne County, Michigan, 12 m. s.w. of Detroit on the Detroit River. Served by the Detroit & Toledo Shore Line, the New York Central, and the Detroit, Toledo & Ironton R.R.'s, as well as an airport, the city is an important manufacturing center. Among the manufactures are chemicals and dyes, soda, gaskets, dairy products, trunks, cement, and brass pipe fittings. Wyandotte manufacturers were pioneers in the steel industry. The first steel-analysis laboratory in the U.S. was established here in 1862, and the first Bessemer steel was produced here in 1864. The city, laid out in 1854, was incorporated in 1866. Population, 1950, 36,846.

Wyandotte Cave (*wī′ạn-dŏt ḳāv*), an important subterranean passage 4 m. N. of Leavenworth, Ind. It rivals the Mammoth Cave of Kentucky and has been explored for about 22 m. The two largest rooms range in height from 150 to 245 ft. and have beautifully formed chambers of stalactites and stalagmites. The different places of interest include those known as the White Cloud Room, the Mammoth Hall, the Pillared Palace, and the Beauty's Bower. In some places the walls are covered with crystals of epsom salt. Beautiful white gypsum rosettes are also found in the cave.

Wyant (*wī′ạnt*), ALEXANDER H., landscape painter, born in Port Washington, O., Jan. 11, 1836; died in New York City, Nov. 29, 1892. After studying in his native country, he received instruction under H. Gude at Karlsruhe, Germany. He visited many countries of Europe, studied in England, especially the works of Constable and Turner, and on returning to the U.S. was made an Academician, in 1869. Connected with the Hudson River School, he was much interested in painting autumn effects in American forests, particularly along the Ohio River and in the Adirondacks. His best works include "Scene in the Adirondacks," "Late Autumn," "View on Lake George," "Sunset on the Prairie," "Scene on the Upper Susquehanna," and "Scene on the Upper Little Miami."

Wyatt (*wī′ŭt*), SIR THOMAS, poet, born in Kent, England, in 1503; died in Dorsetshire, England, Oct. 11, 1542. After studying at Cambridge, he became attached to the court of Henry VIII and was present at his wedding with Anne Boleyn. He was knighted in 1537 and was twice sent as ambassador to the court of Charles V. On returning to England he lived in comparative retirement at Allington, his birthplace, where he devoted himself to writing poems and satires. He was sent to the Tower for high treason in 1541, but was soon released. He introduced the sonnet to English poetry and his songs and sonnets are among the best early literary works in England, ranking with those of Surrey.

Wycherley (*wĭch′ẽr-lĭ*), WILLIAM, dramatist, born in Clive, Shropshire, England, about 1640; died in 1716. Much of his youth was spent in France, where, when he was no more than 15, he benefited from the opportunity to converse with some of the foremost ladies of the French court. He was at Oxford before 1660 but did not matriculate, and in 1659 he was a member, for a time, of the Inner Temple. His dramatic career belongs to the decade of the seventies. Wycherley's latter years were marked by constant financial distress. Rejecting the assistance of Charles II, he solved his problem temporarily by making an advantageous marriage. At the time of his wife's death, however, he was in a debtors' prison, from which he was rescued by James II. His second marriage, which he delayed until the last hours of his life, was contracted specifically so that he might be able to pay his debts. The works of his apprenticeship were "Love in a Wood, or St. James's Park" (1671-72) and "The Gentleman Dancing-Master" (1673). His most effective comedies were "The Country Wife" (1675) and "The Plain Dealer" (1677). Gentle and generous in his personal life, Wycherley wrote dramatic works characterized by brutality and coarseness. He is distinguished from his contemporaries, however, by the seriousness of his purpose and by his vigorous and clear delineation of character.

Wycliffe (*wĭk′lĭf*) or WYCLIF, JOHN, religious reformer, born in Yorkshire, England, *ca.* 1324; died in Lutterworth, Leicestershire, Dec. 31, 1384. A fellow and later (*ca.* 1356) a master of Balliol Coll., Oxford, he was subsequently made rector at Fillingham, Lincolnshire (1361), at Ludgershall, Buckinghamshire (1368), and at Lutterworth (1374). Critical of the wealth and frequent corruption of the clergy, he vigorously opposed the abuse of power by the Church and challenged many of its doctrines, particularly the concept of transubstantiation (*q.v.*). Believing the Scriptures, rather than Church or clergy, to be the proper link between God and man, he was responsible (with the aid of followers) for the first complete translation of the Bible from Latin into English, thereby contributing greatly to the development of modern English. Through his own sermons and those of his "poor priests," he won considerable support for his teachings. In 1374 he accompanied John of Gaunt to Bruges to confer with the papal nuncios over a payment of tribute to the Holy See.

In 1377 he was summoned before the Convocation as an enemy of Rome. The pope signed five bulls against him, authorizing his imprisonment. Although this order was not carried out, in 1380 and again in 1382 he was condemned as a heretic and his followers persecuted by the English clergy. Left unmolested at Lutterworth, Wycliffe wrote tirelessly against the papal claims.

Courtesy American Bible Society, N. Y.

JOHN WYCLIFFE

His doctrines were condemned in 1415 (after his death) by the Synod of Constance, and Wycliffe's bones were exhumed and burned. Adherents of his views, known as Lollards (*q.v.*), carried on his work and paved the way for the Protestant Reformation in England. His influence on John Huss, whose thinking, in turn, influenced Martin Luther (*qq.v.*), was a force leading to the Reformation (*q.v.*).

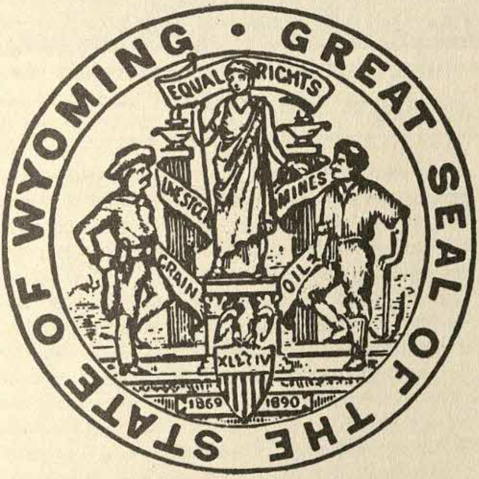
Originally, Wycliffe was a Nominalist (see *Nominalism*), but he became increasingly attracted by the teachings of St. Augustine, and thus he adhered to the metaphysical concept of the other Scholastics (see *Scholasticism*). With almost modern skepticism, he examined the contemporary teachings of the Church and found himself compelled to object to many of them, always, however, using the Scriptures as the basis of his teachings. It was especially St. Augustine's concept of grace (*q.v.*) which made him object to the usual practices of contemporary sacramental doctrine. He criticized many outgrowths of the worship of the saints, questioned the advantage of celibacy for priests, and fought against the doctrine of transubstantiation and against oral confession.

Wye (*wī*), a river of Wales and England. It rises on Plynlimmon Mt., Montgomeryshire, Wales, near the source of the Severn River, and flows 130 m. S.E. into the Severn estuary, 2 m. S. of Chepstow, England. The course of the river, which passes Rhayader, Builthwells, Hereford, Monmouth, and Chepstow, is noted for its beauty.

Wylie (*wī′lĭ*), ELINOR, poet and novelist, born in Somerville, N.J., Sept. 7, 1885; died in New York, N.Y., Dec. 16, 1928. Educated in private schools in Bryn Mawr, Pa., and Washington, D.C., she established her reputation as a poet with "Nets to Catch the Wind" in 1921. In 1923 a volume entitled "Black Armour" appeared, followed by "Trivial Breath" (1928); "Angels and Earthly Creatures" (1929) and "Last Poems" (1943) were published posthumously. An ardent admirer of Shelley, she wrote with subtlety, in a vein often characterized as metaphysical, and is generally ranked as an outstanding 20th-century poet. In 1932 her "Collected Poems" appeared and in 1933, "Collected Prose," both edited by William Rose Benét (*q.v.*), her third husband. She was also the author of four novels—"Jennifer Lorn, a Sedate Extravaganza" (1923), "The Venetian Glass Nephew" (1925), "The Orphan Angel" (1926), and "Mr. Hodge and Mr. Hazard" (1928).

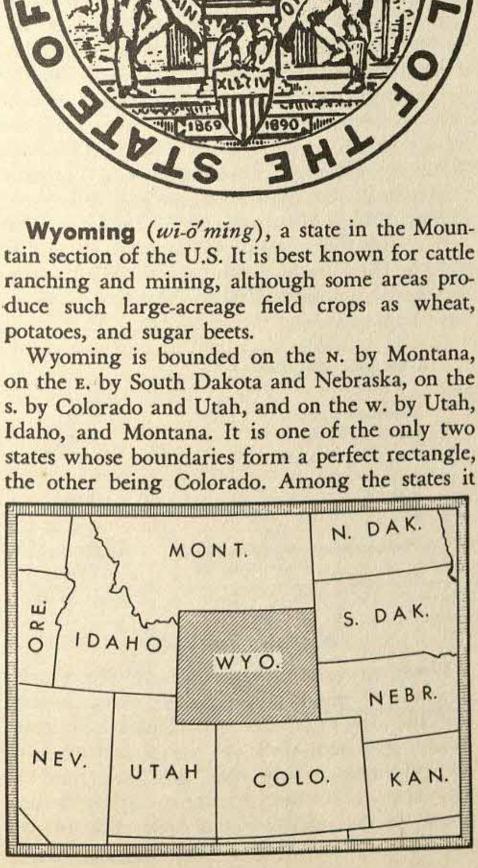
Wylie, PHILIP GORDON, writer, born in Beverly, Mass., May 12, 1902. He attended Princeton Univ. for three years, was on the staff (1925-27) of the *New Yorker,* and wrote for Paramount Pictures (1931-33) and Metro-Goldwyn-Mayer (1936-37). A contributor to leading magazines and the author of many books, he uses social criticism as well as sea adventures as his subjects. His works include "Babes and Sucklings" (1929), "Gladiator" (1930), "Finnley Wren" (1934), all novels; and "A Generation of Vipers" (1942), "Essay on Morals" (1947), "Opus 21" (1949), "Denizens of the Deep" (1953), "The Best of Crunch and Des" (1954), and "Innocent Ambassadors" (1957).

Wynne (*wĭn*), a city in Arkansas, seat of Cross County, on Crowley's Ridge, 46 m. w. of Memphis, Tenn. It is a shipping point for fruit (particularly peaches), cotton, and lumber. Wynne was founded in 1863. Population, 1950, 4,142.



Wyoming (*wī-ō′mĭng*), a state in the Mountain section of the U.S. It is best known for cattle ranching and mining, although some areas produce such large-acreage field crops as wheat, potatoes, and sugar beets.

Wyoming is bounded on the N. by Montana, on the E. by South Dakota and Nebraska, on the S. by Colorado and Utah, and on the W. by Utah, Idaho, and Montana. It is one of the only two states whose boundaries form a perfect rectangle, the other being Colorado. Among the states it ranks ninth in size and 49th in population, according to the 1958 estimates of civilian population (Alaska, Hawaii, and the District of Columbia included in both rankings). It was named for the Wyoming Valley in Pennsylvania, from a Delaware-Indian word meaning "great plains." Its nickname is the "Equality State," from the fact that while still a territory it was the first organized area in the U.S. to give women equal voting rights with men.



Location	Between 104°3′ and 111°3′ W. long. and 41° and 45° N. lat.
Area	97,914 sq. m.
Land	97,506 sq. m.
Inland water	408 sq. m.
Greatest extent:	
North to south	275 m.
East to west	365 m.
Population (1950)	290,529
Capital city	Cheyenne
Highest point	Gannett Peak (13,785 ft.)
Lowest point	Belle Fourche River (3,100 ft.)
Admitted to the Union (44th state)	1890
Song (unofficial)	"Wyoming," words by Charles E. Winter, music by G. E. Knapp
Flower	Indian paintbrush
Bird	Western meadowlark
Motto	"Equal Rights"
Flag	See color plate in Vol. XI

GEOGRAPHY

Wyoming occupies a high plateau interlaced by numerous mountain ranges, all parts of the Rocky Mt. system. The state consists of two major regions, of which the Rocky Mt. area is by far the larger, covering most of the western half and most of the southeastern quarter of the state. The mountain area may be outlined, broadly, by a line drawn from Sheridan to Casper to Douglas to Laramie. The principal ranges are the Big Horn range in the north central region; the Absaroka, Gros Ventre, Owl Creek, and Teton ranges in the northwest; the Salt River and Wind River ranges in the west; and the Sierra Madre, Medicine Bow, and Laramie ranges in the south. The highest peaks are in the Absaroka, Wind River, and Teton ranges. In addition to these major ranges, there are many lesser ones, among them the Aspen, Crooks, Seminoe, Green, and Granite mountains, and the Bear River Divide. Many peaks of these ranges rise from 8,000 to 10,000 ft. above sea level. The Black Hills and Bad Lands of South Dakota and the butte country of Nebraska extend into the northeastern corner of the state. The Continental Divide, the watershed between the Atlantic and Pacific oceans, crosses the state in a southeasterly direction, from the northwestern corner of the state in Yellowstone National Park to a point on the southern border *ca.* 55 m. S.E. of Rawlins. There are numerous valleys and intermountain basins, the largest of which are the Wind River, Green River, and

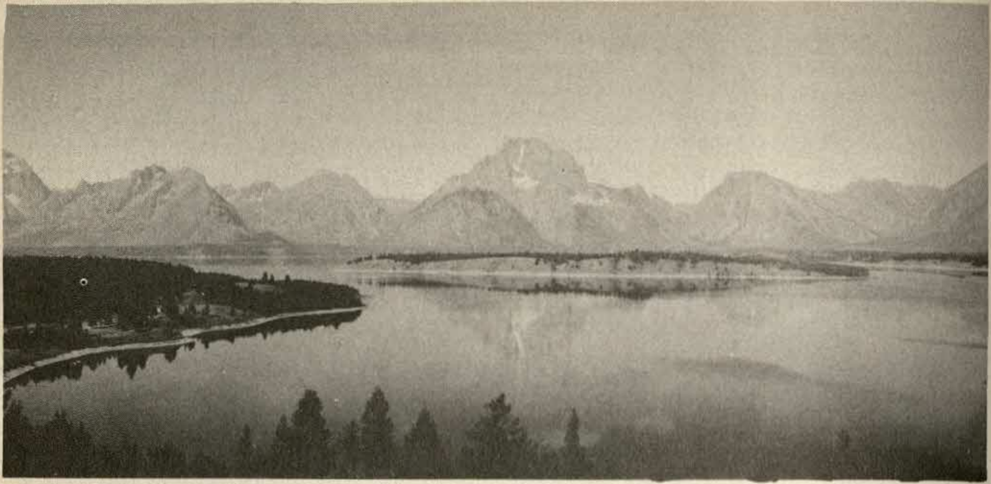


Photo by E. E. Dagley, courtesy Dept. of Commerce & Industry, Wyo.

WYOMING. VIEW OF THE TETON RANGE FROM JACKSON LAKE

Great Divide basins. The latter is a desert area into which streams flow only to vanish in the alkali sands.

Approximately the whole northeastern quarter and half of the southeastern quarter of Wyoming lie on the Great Plains, a high, semiarid flatland marked by very gently rolling hills, an area extending some 600 m. eastward from the foothills of the Rocky Mts. to approximately a north-south line from Winnipeg to Omaha to Topeka. This area is largely devoted to cattle ranching, although crops suited to dry farming and to irrigation farming are also extensively raised.

Because of the Continental Divide, Wyoming's rivers reach diverse ends. The Green River, in the southwestern part of the state, flows south into Utah and the Colorado River; the Snake River, in the northwestern corner, flows into the Columbia River. Most of the rivers east of the Divide—of which the most important are the Yellowstone, Wind, Big Horn, Belle Fourche, Laramie, Sweetwater, and North Platte—all feed, directly or indirectly, into the Missouri River. Many of the rivers have cut out spectacular canyons, such as the Yellowstone, Green, Shoshone, and North Platte; one of the deepest is the Wind River Canyon of the Big Horn. The principal natural bodies of water are Yellowstone Lake and Jackson Lake, in the northwest. Major reservoirs include the Pathfinder and Seminoe reservoirs in south central, Boysen Reservoir in central, Glendoe Reservoir in southeastern, and Keyhole Reservoir in northeastern, Wyoming. There are numerous smaller reservoirs as well.

Climate: Lying on a high plateau, with an average altitude of 6,700 ft. (higher than any other state except Colorado) and with virtually no water surfaces, Wyoming has an inland continental climate. In the winter, at the higher altitudes and on the broad, windswept plains and basins, temperatures have been known to go as low as −40° to −50° F., and the state occasionally suffers severe blizzards. Summer temperatures, in the Great Plains area and in the basins, sometimes rise to more than 100° F. Low humidity, however, renders such temperatures less uncomfortable than they sound; relative-humidity readings sometimes reach as low as 7 per cent even in nondesert areas. On an average, there are *ca.* 300 sunshiny days per year. Rainfall tends to be scanty, although considerable local variation results from altitude, forestation, and desert conditions. The smallest amount of annual rainfall ever recorded was 5 in., at the northern end of the Big Horn Basin. In the northwestern corner of the state, in the Yellowstone Park area, 50 in. have been reported.

Normal temperature, Cheyenne	
January	25.5° F.
July	68.1° F.
Annual mean	44.9° F.
Latest frost, Cheyenne	June 6
Earliest frost, Cheyenne	Aug. 25
Precipitation, Cheyenne	
January	0.56 in.
July	1.96 in.
Annual	16.25 in.
Average growing season, Cheyenne	141 days
Yellowstone Park	116 days

NATURAL RESOURCES

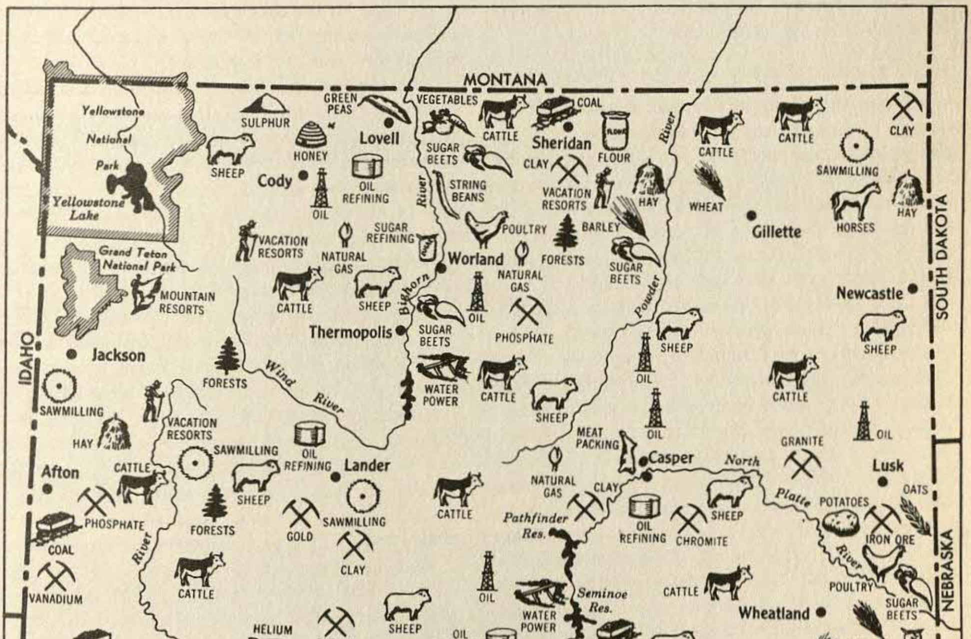
Wyoming is estimated to have the fourth-largest coal reserves among the states. Besides coal, the most important resources are petroleum, natural gas, iron, sand and gravel, sodium salts, clays, bentonite, trona, stone, gold, and uranium. In recent years there has been increasing emphasis on the discovery and production of uranium ores. There is a good deal of timber, mostly in national forests, which in 1957 covered 9,589,556 acres, or *ca.* 52 per cent of the area of the state, but lumbering is somewhat less than a major industry. Water is also considered a valued resource. Water conservation developed toward the end of the 19th century, and large-scale irrigation projects date from the early years of the 20th century.

Wyoming's Economy

The major branch of agriculture in Wyoming has always been the raising of cattle and sheep, originally because of the availability of vast open ranges covered with buffalo grass and other hardy native grasses. With the development of dry-farming techniques and of irrigation, crop farming also became important. In 1954 Wyoming had a total farm acreage of 34,989,000, with an average of 3,069 acres per farm. About 1,500,000 acres of farm land were under irrigation. Besides livestock, the principal agricultural products are hay, wheat, potatoes, sugar beets, dry beans, and dairy products. The most valuable product is livestock, which in 1954 had a cash value of $84,287,000; in

ANNUAL STATE EVENTS

Days of '49	Second week end in June; Greybull
2 Bars 7 Ranch Rodeo and Championship Range Branding Contest	Fourth Sunday in June; Tie Siding
Lake Hattie Boat Races	July 4; Laramie
Cody Stampede	July 4; Cody
Jubilee Days Celebration	Second week end in July; Laramie
Sheridan Rodeo	Third week end in July; Sheridan
Frontier Days Celebration	Third week in July; Cheyenne
Arapaho Sun Dance	Fourth week end in July; Ethete
Indian Pageant, "Gift of the Waters"	First Sunday in August; Thermopolis
Shoshone Sun Dance	Third week in August; Ft. Washakie
State Fair	August-September; Douglas



the same year the cash value of all other farm products was $30,848,000. Cash income in 1957 from crops, livestock, and government payments was $138,004,000. In 1954 *ca.* 25,000 persons were engaged in agriculture.

In 1956 Wyoming ranked 6th in production of petroleum, 10th in natural gas, 16th in coal, and 17th in production of all minerals combined. Mineral production was valued at $316,897,000; Wyoming provided 1.83 per cent of the total U.S. production.

The leading industries are the production and refining of petroleum, coal mining, wool production, transportation (railway and truck), and sugar-beet refining. There are oil refineries at Casper, Sinclair, Cody, and Cheyenne; and important railroad shops are at Cheyenne, Laramie, and Green River. In terms of employment and cash receipts, the sale of goods and services was in 1956 the leading enterprise, with mining (including oil and gas production) second, and manufacturing third. The value added by manufacture in 1956 was $61,000,000. Wyoming's total labor force in 1950 was 113,000.

TRANSPORTATION AND COMMUNICATION

None of the rivers in the state is navigable, although the early trappers used crude boats on the North Platte River to get their furs to St. Louis. Several of the early wagon trails to the Far West crossed the state. The first railroad in the state was the Union Pacific R.R. (1867). The other railroads are the Chicago, Burlington & Quincy R.R., the Chicago and North Western Ry., and the Colorado and Southern Ry. The mileage of operating lines in 1956 was 1,883 m. The surfaced roads totaled 11,729 m.; total road mileage was 49,502. All the principal cities have airfields, and many businessmen and ranchers engage in private flying. There were, in 1959, 26 radio stations and three television stations. The first newspaper published in the state was the Ft. Bridger *Daily Telegraph* (1863). A notable early paper was the Laramie *Boomerang,* founded in 1881 by humorist Edgar Wilson (Bill) Nye. The leading newspapers today are the *Wyoming Eagle* and *Wyoming State Tribune,* both in Cheyenne, the Casper *Tribune-Herald* and *Star,* the Sheridan *Press,* and the Laramie *Boomerang.*

POPULATION

Wyoming has 23 counties (plus Yellowstone National Park, itself the size of another county). In 1950 the urban population represented 49.8 per cent of the total population, and the rural population, 50.2 per cent. Between 1940 and 1950, the urban population rose by 54.5 per cent. The rural population declined by 7.2 per cent. On July 1, 1958, the population of Wyoming was estimated at 320,000. In 1950 white persons numbered 284,009; of these, 271,089 were native born and 13,920 were foreign born. Nonwhite persons totaled 6,520; of this group, 3,237 were Indians, 2,557 were Negroes, and the remainder included Japanese, Chinese, and others. Population density in 1950 averaged 3 per sq. m.

The major religious faiths, in order of size, in 1950 were the Protestant and the Roman Catholic, with a very small Jewish group. The predominant Protestant bodies were the Church of Jesus Christ of Latter-day Saints, the Protestant Episcopal Church, The Methodist Church, the Presbyterian Church in the U.S.A., and the American Baptist Convention.

Chief Cities: Cheyenne, the capital, in the extreme southeastern corner of the state, is the largest city. It is primarily a railroad, airline, and goods-distribution center.

Casper, in the east central portion of the state, surrounded by an oil-producing and livestock-growing region, is the second-largest city.

Laramie, in the southeastern corner of the state, in cattle country, is the third-largest city. It is the seat of the Univ. of Wyoming.

Sheridan, in the north central section, is the fourth-largest city. It is in a cattle-raising and irrigated-farming countryside and is also in summer-resort country.

Famous Men and Women: Arnold, Thurman W. (1891-), lawyer, author, U.S. Assistant Attorney General (1938-43).

Baker, Jim (1818-98), trapper, Indian fighter, and scout in the 1840's.

Hebard, Grace Raymond (1861-1936), librarian, teacher, researcher, author of several books on Wyoming.

Ross, Nellie Tayloe, first woman governor of any U.S. state (1925-27); first woman director of the U.S. Mint (1933-53).

Van Devanter, Willis (1859-1941), chief justice of the territorial supreme court (1889); one of the framers of the state constitution; later Associate Justice of the U.S. Supreme Court (1910-37).

Warren, Francis E. (1844-1929), pioneer in irrigation and in sheep farming; last governor of the territory and first state governor; U.S. Senator from Wyoming (1894-1929).

EDUCATION

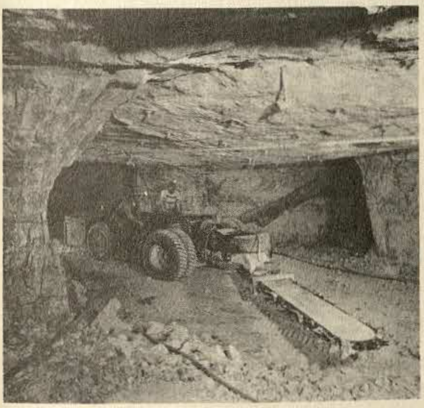
Education is free and compulsory for children between the ages of seven and 16, or until they leave the eighth grade. The state's public-school system was founded in 1869. Enrollment in the public schools in 1958 totaled 77,200. The principal institution of higher learning is the Univ. of Wyoming at Laramie. There are junior colleges at Powell, Torrington, Sheridan, and Casper. All the principal cities have public libraries. The Univ. of Wyoming has a special Robert Frost

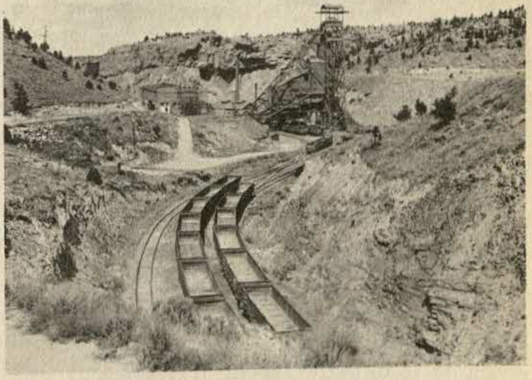
REMINDERS OF FRONTIER DAYS

Wyoming was the scene of violent Indian uprisings in the 1870's, and this mesa (*left*) serves as a rugged monument commemorating one of the battles. The cowboy's life is honored in the state's many rodeos, which preserve the institutions of the open range, such as this chuck-wagon race (*below*) at Cheyenne (*courtesy Cheyenne Chamber of Commerce*)

THE ECONOMIC BASE

Mineral deposits are an important source of the state's wealth. This rare underground trona mine (*below*) employs trackless equipment, and the roof is supported by a series of bolts. An iron mine (*below right*) which has exhausted an open pit now extracts the ore beneath the earth (*courtesy Colorado Fuel & Iron Corp.*). Stock raising (*bottom*)—cattle and sheep—is Wyoming's main agricultural enterprise; the sparse grass often necessitates a large grazing area for each animal, making co-operation between ranchers essential (*courtesy Guy Woodward*)





Library of Poetry, a division of university archives and history of the West, and a program of American studies (endowed by William Robertson Coe). A state library and a department of archives and history are located in Cheyenne.

Wyoming's cultural institutions include a state museum in Cheyenne, the Ft. Bridger Museum in southwestern Wyoming, and the Pioneer Museum in Douglas. More than 25 other museums in the state are maintained by pioneer and historical societies, governmental units, and private persons. Cheyenne has a symphony orchestra and community chorus, Laramie has a university symphony orchestra, and Casper has a Philharmonic Society orchestra.

SCENIC WONDERLAND

The highway from Cody, Wyo., to Yellowstone National Park at Shoshone Canyon and Buffalo Bill Dam

Courtesy U.S.Bureau of Reclamation

GOVERNMENT

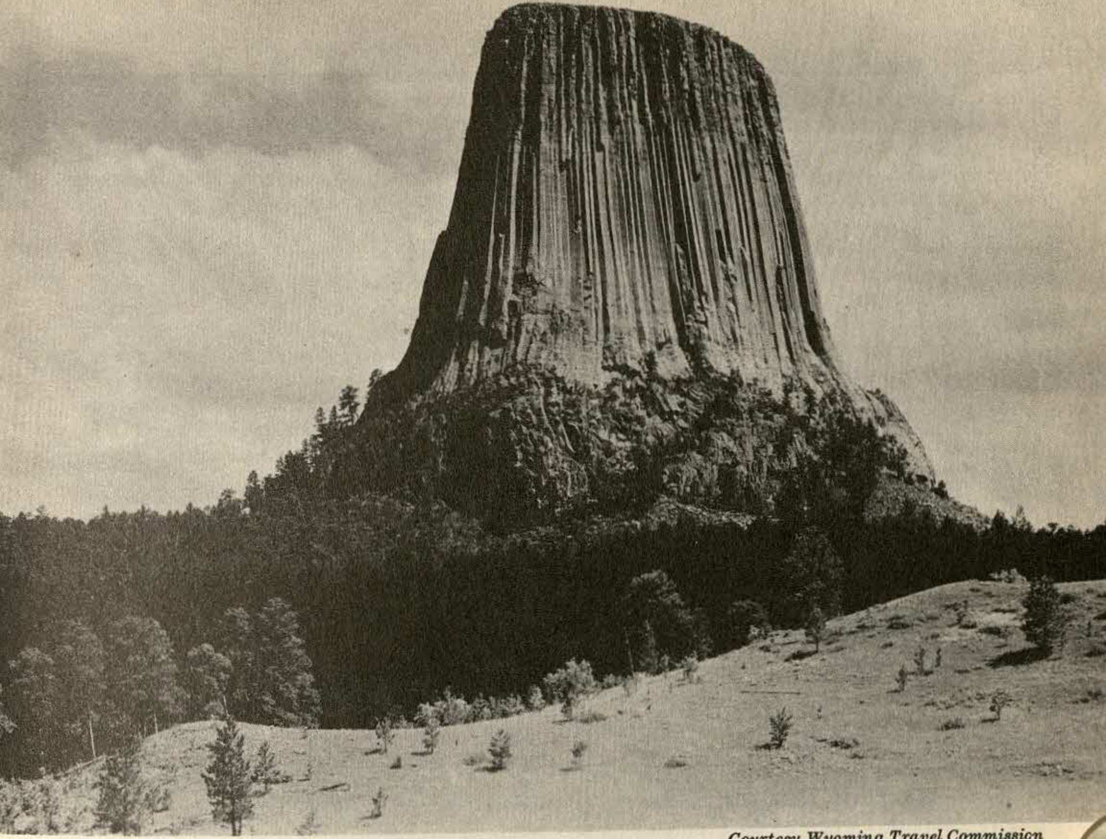
Wyoming is governed under provisions of a constitution adopted in 1890, when the state was admitted to the Union. The constitution gives executive authority to a governor, secretary of state, treasurer, auditor, and superintendent of public instruction, all elected for four-year terms. The legislature consists of a senate of 27 members, elected for four-year terms (half replaced every two years), and a house of representatives of 56 members, elected biennially. The legislature meets in Cheyenne, the capital city, on the second Tuesday in January of odd-numbered years; the normal session is limited by law to 40 days. There is a supreme court of three justices, elected for eight-year terms. Seven district courts share 11 judges, elected for six-year terms. There are also local justices of the peace. The state is represented in the U.S. Congress by two Senators and one Representative.

HISTORY

Wyoming was the historic home of numerous nomadic Plains Indians, principally the Cheyenne, Crow, Sioux, Arapaho, and Shoshone tribes. It may have been first seen by white men in 1743, when a family of French-Canadian trappers named La Vérendrye are said to have traveled as far south as the Big Horn Mts. Some 60 years later, in 1807, John Colter, a former member of the expedition of Meriwether Lewis and William Clark, discovered the Yellowstone Park region. Fur traders explored and exploited the area from 1807 to *ca.* 1840. A party of traders from Astoria, Ore., crossed the state from west to east in 1812-13, on approximately the route of the future Oregon Trail. The fur trade was ended rather abruptly by the passing from fashion of the beaver hat, but its economic importance was superseded by waves of mass migration. By 1850 three major westward routes crossed Wyoming: the Oregon, Mormon, and California trails. Wild

MAJOR RECREATIONAL AND HISTORIC FEATURES

Name and Type	*Size and Location*	*Points of Interest*
Grand Teton National Park (established 1929)	310,350 acres, in northwestern Wyoming, just south of Yellowstone National Park (U.S. 89, 287)	The most impressive peaks of the Teton Range, a landmark of Indians and "mountain men"; includes part of Jackson Hole, winter feeding grounds of largest American elk herd
Yellowstone National Park (established 1872)	2,039,217 acres, in northwestern Wyoming; the remainder in Montana and Idaho (U.S. 14, 20)	World's greatest geyser area; in 3,472 sq. m., some 10,000 thermal features—hot springs, pools, and more than 200 geysers (most famous, Old Faithful, erupts ca. every 60 min.); falls and canyon of Yellowstone River; one of the world's greatest wildlife sanctuaries and the nation's first national park
Devils Tower National Monument (established 1906)	1,347 acres, in northeastern Wyoming (U.S. 14)	Spectacular pillar of columnar rock, 865 ft. high, eroded remains of volcanic activity; the first national monument
Ft. Laramie National Monument (established 1938)	214 acres, in southeastern Wyoming (U.S. 26)	Site of fur-trading post; ruins of principal army post guarding trails to Oregon, Utah, and California, 1834–90
Red Desert Basin	ca. 10,000 sq. m., in south central Wyoming; key town, Rock Springs (U.S. 30)	Alkali bottoms, dry lakes; famous for hunting of pronghorn antelope



Courtesy Wyoming Travel Commission

DEVILS TOWER IN WYOMING

This 865-ft. volcanic rock rising out of the earth in northeastern Wyoming is the focal point of Devils Tower National Monument, the first section of the U.S. to be designated a national monument

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game, the Indians' subsistence, began to vanish; the white man's diseases appeared; the whites were often rough or unscrupulous, or both. These and other factors led the Indians to violent resistance. Indian raids resulted in military posts to guard the trails, such as Ft. Kearny, Ft. Laramie, and Ft. Bridger. Gold was discovered on the Sweetwater River in 1867. A gold rush followed, and other minerals were later discovered elsewhere. The railroad, coming in 1869, introduced coal mining.

The Territory of Wyoming was created in 1868 and organized in 1869. The first territorial legislature, in 1869, granted women full voting rights—the first political subdivision in the U.S. to do so. This provision was carried over into the state constitution when Wyoming was admitted to the Union on July 10, 1890. A major factor in the settlement of the state was a mass northward movement of Texas cattlemen, who, about 1870, began the business of raising vast herds of cattle on open-range land. These were quickly followed by others, representing capital and enterprisers from the East and from Europe, principally England and Scotland. The cattle business was the source of many fortunes, and a great deal of American Western and "cowboy" literature and tradition (*e.g.*, Owen Wister's famous novel, "The Virginian") stems from Wyoming's open-range days. The Indians fought desperately against railroad construction and the invasion of the white man's cattle. Serious Indian wars ran from 1874 to 1879 (the well-publicized defeat of Gen. George A. Custer in 1876 in neighboring Montana occurred in one of these campaigns); but the Indians were finally subdued and settled on reservations. The cattlemen for decades dominated the state's politics and economy. There were protracted and sometimes bloody struggles between cattlemen and sheep raisers, and between both of these and the farming homesteaders. The last major battle between ranchers and farmers erupted in 1892 in the so-called Johnson County War, which had to be suppressed by Federal troops. The open range slowly gave way to private lands at just about the time when the values of irrigation were becoming increasingly evident, and cattle, sheep, and crops have since shared the state's surfaces.

Petroleum had been discovered earlier, but in 1912 a full-scale oil boom followed the development of the Salt Creek Field near Casper and the building of a refinery there. Wyoming supplied 11,393 men to the armed forces in World War I and 32,549 men and women to the services in World War II. In 1925-27 the state had the first woman governor in the U.S. The mining of coal has been considerably reduced by the conversion of railroads to diesel power; but the uranium boom that developed in the 1950's has taken up much of the industrial and economic slack caused by the coal situation. Cattle raising continues to thrive, and in recent years the state has prospered considerably by the increasing popularity of tourism and winter sports.

See also separate entries on most of the individuals and geographical and historical subjects mentioned in this article.

Wyoming Mountain, a ridge about 18 m. long in Luzerne County in eastern Pennsylvania. It extends along the southeast bank of the Susquehanna River and borders on the Wyoming Valley (*q.v.*).

Wyoming Peak, a mountain in Wyoming. It is located in the western part of the state, at the southern end of the Salt River Range, and is 11,363 ft. high.

Wyoming, UNIVERSITY OF, a coeducational, state land-grant institution of higher learning at Laramie, Wyo., founded in 1887. It comprises colleges of agriculture, arts and sciences, commerce, education, engineering, graduate study, law, nursing, and pharmacy. It also maintains an elementary and secondary school for teacher training. The library has more than 125,000 volumes. The annual student enrollment totals *ca.* 3,500, and there are some 350 members of the faculty. The physical plant is valued at $3,500,000.

Wyoming Valley, a valley in northeastern Pennsylvania along the Susquehanna River. It is in a rich anthracite region whose chief city is Wilkes-Barre. The valley proper is *ca.* 3 m. wide and *ca.* 20 m. long, but historically the name refers also to the surrounding area, which was in dispute between Connecticut and Pennsylvania. The Susquehanna Land Co. of Connecticut bought (1754) land in the area from the Indians and settled there, precipitating the Pennamite Wars between the two colonies. Rapid settling continued despite the unrest, which culminated in the famous Wyoming massacre at Forty Fort (July 1778), in which Connecticut settlers were defeated and barbarously treated by a party of Tories and Indians. A court of arbitration appointed by the Continental Congress decided (1782) in favor of Pennsylvania, but fighting continued until around 1800, while the Pennsylvania legislature settled with the Connecticut claimants by means of several compromises. A monument, erected at Wyoming, Pa., *ca.* 1843, marks the site of the battle which preceded the massacre.

Wyrdes (*wĭrdz*) or WEIRDS, in mythology, the Anglo-Saxon fates, the three sisters who controlled the destiny of men. They appear as the *Three Witches* in Shakespeare's "Macbeth" and survive in Scottish folk tales as witches and prophesiers.

Wyss (*vēs*), JOHANN RUDOLF, author, born in Bern, Switzerland, March 13, 1781; died there, March 31, 1830. He became (1806) professor of philosophy at the Univ. of Bern and later was chief librarian. The author of the Swiss national anthem, he is best known for "The Swiss Family Robinson" (1813; transl., 1820), which, however, is sometimes credited to his father Johann David Wyss (1743-1818). He also had a deep interest in Swiss folk tales and wrote *"Idyllen und Erzählungen aus der Schweiz"* (1815-22).

Wyszyński (*vĭ-shĭn'sḳē*), STEFAN, cardinal, Roman Catholic primate of Poland, born in Zuzela, Poland, Aug. 3, 1901. Educated at the Catholic Univ. of Lublin, he was ordained a priest in 1924. He founded and directed (1935-39) a Christian Workers' Univ. After World War II, during which he was held in a German concentration camp, he was named bishop of Lublin (1946) and archbishop of Warsaw and Gniezno, with the title of primate (1948). He was raised to cardinal in 1952 and was imprisoned by the Polish Communist government from 1953 to 1956.

Wythe (*wĭth*), GEORGE, jurist, born in Elizabeth City County, Virginia, in 1726; died in Richmond, June 8, 1806. Although he had little formal education, he studied law and, after being admitted to the bar, became a successful lawyer and a leader in American jurisprudence. During his tenure (1754-55, 1758-68, 1769-75) in the Virginia House of Burgesses, he drew up (1764) a remonstrance protesting the onerous Stamp Act (*q.v.*). He was a delegate (1775-76) to the Continental Congress, a signer of the Declaration of Independence, and speaker (1777) of the Virginia house of delegates. In 1778 he became chancellor of the Virginia court, a post he occupied until his death. He was professor of law (1779-90) at the Coll. of William and Mary and a member (1787) of the Federal Constitutional Convention. His influence as a teacher was great; his pupils included John Marshall and Henry Clay.

Wytheville (*wĭth-vĭl*), a town in Virginia, seat of Wythe County, 65 m. s.w. of Roanoke. It is the trade, market, and processing center for the surrounding agricultural and stock-raising area. The chief industries are meat-packing and flour and lumber milling; the manufactures include hosiery, shirts, textiles, and furniture. Formerly called Abbeville, it was founded in 1792 and incorporated in 1839. Population, 1950, 5,513.

X

X (*ĕks*), the 24th letter and 19th consonant of the English alphabet. It is often spoken of as a superfluous letter, because it represents no sound that may not be represented by other letters. Usually it has the sound of *ks* when occurring in the middle of a word, as in *taxes, axis, foxes,* At the beginning of a word it has the sound of *z*. In some words it has the sound of *ks* as a terminate letter, as in *lax, wax, tax*. In Roman writing *x* was the last letter in the alphabet. It signifies 10 as a Roman numeral; when placed horizontally (⋈) it represents 1,000, and with a dash over it ($\bar{X}$) the symbol indicates 10,000. In algebra *x* is the usual symbol for an unknown quantity.

Xanthippe (*zăn-tĭp′ē*), the wife of Socrates, represented by most writers as a scold. It is probable that the small concern shown by Socrates in affairs of household economy caused his wife to be frequently at her wit's end to know how to make housekeeping possible; thus she developed a habit of calling attention to household necessities at times when Socrates returned from long conversations with fellow philosophers and students. Plato describes her as a really kind woman, and one much concerned in the welfare of the household. However, the name has become proverbially associated with one who scolds.

Xanthus (*zăn′thŭs*), an ancient city in the southwestern part of Asia Minor, capital of Lycia, on the Xanthus River, near the present village of Gunik. The city seems to have been founded at a very early date, and its inhabitants were governed by independent princes. Lycia was invaded by the Persians and the capital was twice destroyed, the last time in 546 B.C., and Alexander captured it at the time of his campaign in the East. Brutus with a Roman army took possession of the city in 43 B.C., when only a few of the inhabitants survived. Many ruins of ancient structures have been uncovered, showing that the place was well built and contained many tombs and sculptures. The most noted buldings belonged to the 6th century B.C. and were evidently of Greek origin. They included many theaters, statues of the Nereids, and a sculpture known as the Harpy Tomb, now in the British Museum. Among the remains still intact are the walls of the Acropolis, a Roman gate, and several tombs and temples.

Xavier (*zăv′ĭ-ēr*), SAINT FRANCIS, saint and missionary of the Roman Catholic Church, born in Navarre, Spain, Apr. 7, 1506; died on the island of Sancian, near Macao, China, Dec. 2, 1552. His father was councillor of state to the King of Navarre and sent him to the Univ. of Paris in 1525, where he made remarkable progress in his studies. In 1528 he became lecturer in philosophy, and soon after was granted a degree of master of arts. He was one of the first companions of St. Ignatius Loyola and was ordained priest along with him in 1537. After the Society of Jesus was founded in 1539, he was sent to evangelize the people of the East Indies. He sailed with an associate from Lisbon on Apr. 7, 1541, and reached Mozambique after a voyage of five months. After wintering in the southern part of Africa, he sailed for Ceylon and the Moluccas, and finally visited Japan. Xavier labored for 10 years as a missionary in the East, and died at the time when he intended to begin missionary enterprises in China. The work of Xavier is outstanding among the achievements of noted missionaries. He visited 52 countries to spread the gospel, and witnessed the baptizing of many thousands. Xavier is usually spoken of as the Apostle of the East Indies. Pope Gregory XV canonized him in 1622, and Benedict XIV proclaimed him protector of India. He was buried at Goa, then the capital of the Portuguese Indies. His writings consist largely of epistolary letters and a catechism.

Xebec (*zē′bĕk*), a small vessel which has three masts with both square and lateen sails, variously arranged. It differs from the *felucca,* a coasting vessel employed on the Mediterranean, in that the latter has only lateen sails. The Algerian pirates used xebecs which carried from 12 to 20 guns. Most of these vessels had low sides and the deck was somewhat convex, permitting the water to flow off through the scuppers.

Xenia (*zē′nĭ-ȧ*), county seat of Greene County, Ohio, 50 m. s.w. of Columbus. Served by the Pennsylvania and the Baltimore & Ohio R.R.'s, it is situated in a fertile farming region producing grain, hay, and soybeans. Xenia is the seat of the Ohio Soldiers' and Sailors' Orphans Home, founded for orphans of the veterans of the Civil War, but now providing for orphans of all veterans. Among the manufactures are rope and twine, paper, tinware, glass, shoes, earthenware, tombstones, and machinery. Printing and publishing are also important. The first settlements were made in the vicinity in 1804, and the town was incorporated in 1808, becoming a city in 1870. Xenia was the birthplace of Whitelaw Reid (*q.v.*). Population, 1950, 12,877.

Xenophanes (*zē-nŏf′ȧ-nēz*), philosopher, lived in the 6th century B.C. He was born in Colophon probably *ca.* 520 and lived to be at least 92. He left Colophon for Sicily and later went to Italy, probably to Elea in the southern part of the country. He was a rhapsodist, a traveling minstrel, and the author of a number of works, of which only fragments are extant. Plato and Aristotle both mention him, Plato giving him credit for being the founder of the Eleatic school (*q.v.*) and Aristotle, in his "Metaphysics," stating that he was the first to believe in the unity of all things and calling him "the first of the Eleatic unitarians." Whether Xenophanes was a monotheist or a pantheist has been a subject for philosophical dispute for centuries; however, he said, "There is one God, greatest among gods and men, neither in shape nor in thought like unto mortals. . . . He is all sight, all mind, all ear. . . . Without an effort he ruleth all things by thought. . . ."

Xenophon (*zĕn′ō-fŭn*), general and author, born in Athens, Greece, about 430 B.C.; died *ca.* 355 B.C. He became a pupil of Socrates, under whom he studied philosophy. In 401 B.C. he joined the expedition of the younger Cyrus against Artaxerxes, King of Persia. It was his aim to visit Western Asia rather than to enter into the conflict of battle that he joined the army, but the Greek generals were treacherously murdered at the engagement of Cunaxa, and a large share of the responsibility connected with the generalship devolved upon Xenophon. He was the leading spirit in the famous retreat of the 10,000 Greeks to Trebizond, on the Black Sea, and after returning to Greece joined the military service of the King of Sparta, which was then the foremost state of the Greek world. Later he settled in Elis, where he devoted 20 years to literary work and agriculture.

His chief work is the "Anabasis," in which he relates the history of the expedition into Persia. This work is divided into three parts. The first relates to the invasion of Persia by Cyrus against his brother, Artaxerxes, and includes a description of the Battle of Cunaxa; the second recounts the retreat of the 10,000; and the third part describes the adventures of the Greek army after reaching Trebizond. The work is written in a pure Attic Greek style and exhibits the power of the author as an observer and portrays him as a strong and tireless worker. Other writings include the "Memorabilia," a record of the life and teachings of Socrates; the "Cyropaedia," a romance describing the boyhood and training of Cyrus of Persia; and the "Hellenica."

Xerxes I (*zẽrk′sēz*), King of Persia. He was the eldest son of Darius by Atossa, his second wife, the daughter of Cyrus, although he had older half-brothers. His birth and early history are unknown, but it is reasonably certain that he reigned from 485 to 465 B.C. He is mentioned as Ahasuerus in the Book of Esther, and is famous in history in connection with several noted Greek campaigns. His father died in 485 B.C., while making preparations to invade Greece for the third time. Xerxes spent the first years of his reign putting down revolts in Egypt and Babylonia and then began to make elaborate plans for carrying his father's designs into execution. Provisions were collected to support a vast army for three years, a great transport fleet was constructed, and the most skilled engineers obtainable were engaged to plan the removal of natural obstructions. Some historians, accepting Herodotus's figures, believe that the army and navy represented a combined force of more than 2,000,000 men, but this is generally believed to be a considerable exaggeration. To secure the passage of his army across the Hellespont, Xerxes ordered the construction of a bridge of boats a mile long. Herodotus states that it required seven days and nights for the forces to cross over the Hellespont.

Xerxes, having landed on European soil, marched unobstructed until he reached Thermopylae, where he was brought to a stand by the Spartan leader, Leonidas, who was at the head of a small but determined band of Greek warriors. They guarded the narrow passage with remarkable persistence until they were defeated through treachery (480), but when Xerxes reached Athens he found the city deserted.

Though successful on land, Xerxes found his fleet driven to desperation and finally it was defeated. The Greeks were successful in several engagements at Artemisium and a storm did much damage to the Persian fleet, destroying 400 ships of war. In 480 B.C. the final naval battle was fought at Salamis, where the Persians were defeated with great loss, and Xerxes fled to the Hellespont. A storm had destroyed the bridge of boats in the meantime, but he crossed over in a vessel and left Mardonius with a Persian army of 300,000 men to subdue Greece. Mardonius was defeated by the Greeks the following year in the Battle of Plataea, and in 478 B.C. the last possession of the Persians in Europe was taken from them by the victorious Greeks. Xerxes spent his later years in obscurity and was finally murdered by the commander of his bodyguard, Artabanus, who, it is generally believed, wished to usurp the Persian throne. Artaxerxes, Xerxes's son, ascended the throne in 465 B.C. and killed Artabanus. Herodotus represents Xerxes as cruel and cowardly, but credits him with highly attractive personal qualities, and asserts that he was skillful in furthering the interests of his government.

Ximenes (*zĭ-mē′nĕz*), or JIMENES, FRANCISCO, statesman and cardinal, born at Torrelaguna, Spain, in 1436; died at Branquillas, Nov. 8, 1517. He was born of humble parents, but obtained a liberal education at Salamanca and Rome, and while in the latter city was nominated prebend in the Cathedral of Toledo. The archbishop opposed his appointment and had him imprisoned, but he was released on surrendering his preferment. In 1482 he entered the Franciscan order of monks. His piety and learning caused Isabella to select him as confessor in 1492, and three years afterward she named him archbishop of Toledo. The high degree of confidence placed in Ximenes by Isabella gave him a wide influence in the public affairs of Spain, and on her death, in 1504, he was likewise favored by Philip. Philip named him regent and guardian of Queen Joanna, who was simple-minded, on his death in 1506, and during his incumbency Ximenes extended the power of the crown by reducing that of the nobles. In 1507 he was raised to the dignity of cardinal, and at the death of Ferdinand, in 1516, he was made regent of Castile until the arrival of King Charles I, afterward Charles V of Germany.

Ximenes de Quesada (*zĭ-mē′nĕz dā kä-sä′-THä*), GONZALO, explorer, born in Granada, Spain, in 1495; died at Santa Agueda, South America, Feb. 16, 1579. He came to America on an exploring expedition in 1539, and had charge of the military forces of New Granada, now called Colombia, against the Chibcha Indians. Soon after reaching America he marched southward to conquer the interior regions, and in 1538 founded the city of Bogotá. Benalcázar and Frederman, two other explorers, sailed with him to Europe to submit their disputes to the king for arbitration. After hearing the cause of their disagreement, the king ordered Ximenes fined and suspended, but he was afterward sent as marshal to New Granada, and in 1561 became governor of that region.

Xingú (*shĕn-gōō′*), an important river of Brazil, which rises on the plateau of Matto Grosso and, after a northerly course of 1,150 m., flows into the Amazon, near the head of the estuary. Several impassable falls and rapids obstruct the steam about 150 m. from its mouth, in a part of the river known as the Great Bend. It is navigable for steamers for 110 m.

X Rays (*ĕks′rāz*) or ROENTGEN RAYS, a form of electromagnetic energy—discovered by Wilhelm Konrad Roentgen (*q.v.*) in 1895. They possess characteristics which classify them as a form of light of very high frequency. X rays are produced by directing a stream of electrons at a metal target within a vacuum tube (*q.v.*). The quality of a beam, *i.e.*, its frequency, depends upon the potential difference in kilovolts between the source of the electrons and the target. The higher the kilovoltage, the higher the frequency and the greater the penetrating power.

In medical X rays, kilovoltages between 30 and 150 are used for diagnostic purposes. X rays may be used for fluoroscopy, *i.e.*, the rays are directed through the body part under examination and onto a fluoroscopic screen, which assumes a pattern of lights and shadows in proportion to the absorption by the various body structures in the path of the beam. Light intensifiers or image amplifiers may increase the brightness of the fluoroscopic image so that it may be scanned by a television camera, which may be used to operate as many viewing monitors as desired and at any useful distance from the patient. Motion pictures may be made, as well as shadowgraphs and radiographs.

See also *Fluoroscope; Radiograph*.

Therapeutic X rays are produced by kilovoltages ranging from 15 to several thousand. Being destructive to tissue, the rays are used to destroy or to deter malignancies. X rays have two principal biological effects. Protracted exposure may bring about changes in body cells, with resulting damage to health. They may also bring about reproductive-cell alterations which create genetic changes, with possible damage to offspring. Under proper precautions, these effects may be avoided. See also *Cancer*.

There are many industrial applications for the use of X rays. These may range from the diffractive determination of elements in a substance to the examination of cans of baby food for foreign bodies, and from the examination of stresses in a

X-RAY TV
Doctors can use a form of closed-circuit television to make diagnoses. With X rays, a fluoroscopic image is produced, then intensified, scanned by a television camera, and shown to the doctor on a TV monitor *(left)*. The unit shown is the Televex system of Westinghouse Electric Corp.

space vehicle to the search for contraband and bombs in aircraft luggage.

See also *Medicine*.

Xylene (*zī′lēn*), the name applied to three isomeric hydrocarbons, which were first obtained in a pure state from coal naphtha in 1863. A process was later discovered by which xylene is obtained successfully from wood spirit. The product as a volatile, inflammable liquid. It is colorless, boils at 282° F., and has a peculiar odor. Several derivatives are obtained from it, including methyl-xylene, ethyl-xylene, and the nitro-zylenes.

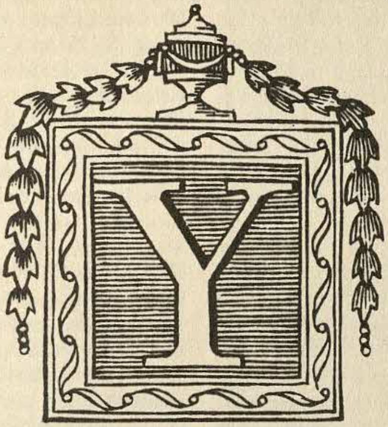
Xylology (*zī-lŏl′ô-jy̆*), the science of wood and its fibrous structure.

Xylonite (*zī′lŭn-īt*), a trade-name for a nitrocellulose plastic, which is frequently sold in rods, sheets, or blocks for manufacture into combs, buttons, and specialties.

Xylophone (*zī′lô-fōn*), a musical instrument which consists of a series of bars of wood or glass, arranged horizontally upon two longitudinal cords or sills. The bars are graduated in length to the musical scale, and the instrument is played by striking them with two small hammers held in the hands. The instrument has a compass of about two octaves. It is of ancient origin and is used extensively among the Poles and Russians.

X Y Z Correspondence (*ĕks wī zē kôr-ê-spŏn′dĕns*), the name applied to certain dispatches between the U.S. and France, at the time John Adams was President. The U.S. had received valuable aid from France at the time of the Revolution, which was in accord with treaties made in 1778, and the latter country desired an alliance with the U.S. in the war against England and other countries, following the overthrow of the monarchy in 1789. An effort to make such an alliance not only failed, but President Washington persisted in preserving neutrality and the government contracted the Jay Treaty with England, whereby the Directory, which then governed France, became offended. It promptly issued letters empowering French vessels to assail American ships, but the President convened Congress in extra session and named John Marshall, Charles C. Pinckney, and Elbridge Gerry as commissioners to treat with France. In the meantime John Adams had succeeded to the Presidency.

Talleyrand, who was then minister of foreign affairs, did not desire to hold an interview with the Americans, but instead sent Hauteval, Hottinger, and Bellamy as special agents to confer with the commissioners. In the dispatches these agents were designated as X, Y, and Z, hence the whole matter became known as the *X Y Z correspondence*, or *mission*. The French agents in the course of the conference requested a monetary consideration or a loan in order to conclude the matter, but the Americans refused to grant such a demand. It was in this connection that Pinckney is quoted as saying, "Millions for defense, but not a cent for tribute." Shortly after the dispatches were submitted to Congress, France ordered Pinckney and Marshall to leave the country and the U.S. government recalled Gerry. War with France was threatened on account of these matters and a few naval engagements occurred, but Napoleon became first consul of France and was favorably inclined toward the U.S. Both countries ratified a treaty in 1800, which was declared in force on Dec. 21, 1801.



Y (*wī*), the 25th letter of the English alphabet. It is used both as a consonant and a vowel. The letter *y* was adopted into the Latin from the Greek letter *upsilon,* and was afterward incorporated into the alphabet of the Anglo-Saxons. As a vowel it is now employed regularly for final *i,* as in *city, pity,* and *multiply.* At the beginning of syllables it is usually a consonant, but is a vowel in that case when it is followed by a consonant, as in *Ypsilanti.* It is always a consonant when followed by a vowel. *Y* is the symbol for ythrium. In Latin it is employed only as a small letter. It has no place in German aside from its use in words of foreign origin. *Y,* as a symbol in algebra, stands for the second variable or unknown quantity.

Y (*ī*), or IJ, the portion of the Zuyder Zee which extends north of Amsterdam, in the province of North Holland. Formerly it was 21 m. in length and had a width of several miles, but it has been almost entirely reclaimed for cultivation, except the central part, which has been deepened as a portion of the North Sea Canal. This canal is connected with the Zuyder Zee by a lock.

Yablonoi (*yȧ-blȧ-noi′*), the name of a range of mountains in Eastern Siberia, in the region east of Lake Baikal. It has a general direction toward the north and northeast, extending a distance of 1,000 m., and merges into the Stanovoi Mts. The highest altitudes are in the southwest, where they rise about 8,500 ft. above the sea. Their slopes are covered with forests, but the summits are bleak and cold.

Yacht (*yŏt*), a sailing vessel which is specially built for speed. Such a vessel is usually designed for pleasure, as for racing or for traveling. Many varieties of yachts are in successful use, ranging from those comparatively small and best adapted for pleasure trips to the seagoing vessels designed for pleasure and racing. The rigs are various, and many sailboats now have engines as accessory power for use during calms. The hull of racing yachts is ballasted quite heavily and they are rigged with large sails, thus being balanced and rigged for considerable speeds. Among the chief rigs for yachts are those known as the yawl, cutter, and schooner. The *yawl* has a running bowsprit, one mast, and a small mizzenmast, while the *cutter* is without the last mentioned. The schooner has two masts—a foremast and a mainmast—and either a standing or a running bowsprit.

Yachting (*yŏt′ĭng*), racing and traveling for pleasure by means of a yacht. Yachting has long ranked as an agreeable sport, both for pure pleasure and for racing. There is an authentic record of yachting clubs for over two centuries. The first sailing club on record, known as the Cork Harbor Water Club and now called the Royal Cork Yacht Club, dates from 1720. In the early history of yachting the boats were small, but they gradually increased in size, while other improvements were added to give them both speed and security. The first yacht club in America was founded at New York by nine yacht owners in 1844 who organized the New York Yacht Club. Since then numerous yacht clubs have been formed all over America, the most noted being the Detroit Yacht Club, Indian Harbor Yacht Club, Corinthian Yacht Club, Larchmont Yacht Club, and the Eastern Yacht Club. Many of these clubs sponsor annual races, the Newport-Plymouth trans-Atlantic race and the New York-Bermuda race being the most important.

In the early days of yachting sailboats were used exclusively, but since about 1920 almost all cruising yachts have been engine-powered. Although the sailboat survives, it is now used only for racing purposes. Also about 1920 many automobile manufacturers entered the field of yacht-making, often producing cruising vessels more than 100 ft. long. These larger vessels, built for world cruising, have sufficient fuel capacity to take them one-third of the way around the world.

Yak (*yăk*), a bovine ruminant native to Central Asia. It is found chiefly in Tibet, and is regarded as intermediate between the bisons and the true oxen. The yak is still abundant in the wild state in the lofty plateau between the Altai Mts. and the Himalayas, where it subsists on the coarse, wiry grass common to that region. In size it does not differ from a small ox, but it has long hair fringing the shoulders, sides, and tail. Its horns are long, smooth, and nearly cylindrical. The color of wild yaks is either dark brown or black, but those domesticated are lighter in color, even white specimens being quite common, and some are hornless. These animals have been domesticated to a considerable extent in Central Africa for their milk and hair, and they are employed as beasts of draft and burden. The milk is considered very rich and yields a curd valuable for food, both in the fresh and dried state. An excellent grade of butter is made of yak milk. Both the butter and flesh are important articles of commerce in Tibet, while the hair is utilized in making jackets, caps, and blankets, and the skin is of value as a leather product. The tail is used as a chowry, or fly flap, in India and Tartary.

Yakima (*yăk'ĭ-mȧ*), a city situated in the center of Yakima valley, Washington. It is served by the Northern Pacific and Union Pacific R.R.'s as well as by Northwest Airlines and by bus and truck lines. A vast irrigated region, the Yakima valley ranks high in the production of apples and pears, and has a large output of cherries, potatoes, nuts, peaches and vegetables. Practically the entire hop production of the State of Washington is derived from the Yakima valley. Sugar beets are one of the valley's principal crops. Other products include livestock, dairy foods, poultry, hay, and grain. The principal industries are beet-sugar refining, lumber, fruit and vegetable canning, dehydrating and commercial freezing of fruits and vegetables, meat packing, box manufacture, brick and cement products, and farm machinery (including tractors and hop-picking machinery).

The eastern gateway to Mt. Rainier National Park and in close proximity to the many excellent camp sites of the Cascade Range, Yakima is a popular summer resort. There are good hunting and fishing facilities as well as many points of historical interest dating from the early Indian wars. Population, 1950, 38,486.

Yakima, a river of Central Washington, which rises in the Cascade Mts. and flows in a general direction toward the southeast. It has a length of about 165 m. and flows into the Columbia some distance above Kennewick. The country along the Yakima includes fine agricultural land, and the river and its tributaries furnish water for irrigating a large region. It receives the inflow from the Naches River near North Yakima. The valley is traversed by the Northern Pacific R.R. for almost the entire length.

Yakima, a confederacy of Indians in North America, formerly found in the eastern part of Washington, but now confined to the Yakima Reservation, in the south central part of Washington. Lewis and Clark came in contact with them in 1804, and they ceded most of their land to the government by treaty and agreed upon the present reservation in 1855. At present they engage chiefly in stock-raising and farming, for which purpose they employ irrigation. The Indians upon the Yakima Reservation number over 2,000; less than half are Yakimas.

Yakutsk (*yȧ-kōōtsk'*), capital of the Yakutsk Autonomous Republic of the Union of Soviet Socialist Republics, in eastern Siberia. It is situated on a tributary of the Lena River, 1,150 m. N.E. of Irkutsk, with which it maintains airline transportation. The city has a cold climate, the winters being long and severe, with an average January temperature of −46° F. In summer trade is carried on via the Lena, Vilini, and Aldan Rivers, but during the long winters there is very little commercial activity. The principal manufactures are candles, utensils, earthenware, and clothing. Fur, gold, and livestock form the basis of a lively trade. Cossacks founded the city in 1632. Population, *ca.* 10,000.

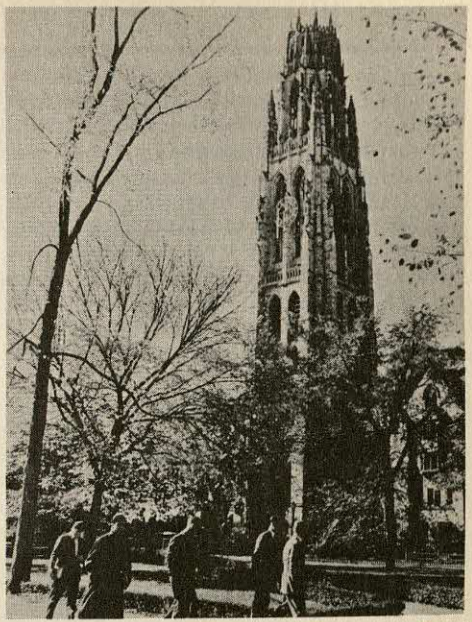
Yakutsk, an autonomous republic of Asiatic Russia within the Russian Soviet Federated Socialist Republic, U.S.S.R. It was created in 1922, and is bounded on the west by the Western Siberian Region, east and south by the Far Eastern Region, north by the Arctic Ocean. Its area is 1,455,000 sq. m.; the capital is Yakutsk. The Lena is the chief river. The Cherskogo and Vilyuiski Mts. cross the region. A severe climate and lack of railroads have hampered the development of Yakutsk, whose main industries are gold-mining and fur trapping. The population, consisting of Yakuts, Tungus, and Russians, number *ca.* 300,000.

Yale (*yāl*), ELIHU, philanthropist, born in Boston, Mass., April 5, 1649; died in London, England, July 8, 1721. His father, David Yale, settled at New Haven, Conn., in 1638(?), but afterward moved to Massachusetts and in 1651 returned to England. Elihu went to India in 1670, where he established himself in trading. He became governor of the East India Co.'s settlement at Madras in 1687, serving in that capacity until 1692. In the meantime he acquired a large fortune and returned to England in 1699. He did not return to America, but became interested in the educational welfare of New England and donated books and money amounting to about $4,000 to the Collegiate School at Saybrook. When that institution was moved to New Haven, its name was changed to Yale Coll. in his honor, and subsequently it became known as Yale Univ. He was buried in Wexham, Wales.

Yale, LINUS, inventor, born in Salisbury, N.Y., Apr. 4, 1821; died in New York City, Dec. 24, 1868. He first studied portrait and landscape painting, but soon turned his attention to mechanics. In 1850 he invented a key for bankers' safes and the famous Yale lock, which he afterward improved by successive inventions. His clockwork mechanism and combination locks completely revolutionized locks and safes, and gave him a place on the list of American inventors. He made a number of inventions and improvements in mechanics' tools, and perfected a device for adjusting the joiner's square at right angles.

Yale University, one of the most noted institutions of higher learning in the U.S. It was founded as the Collegiate School of Connecticut at Branford, Conn., in 1701. Saybrook was its first seat; it was moved to New Haven, its present location, in 1716. In 1718 it took the name Yale Coll. to honor Elihu Yale, its first great benefactor. Before the end of the 18th century, Yale had furnished first presidents for Princeton, Columbia, Dartmouth, and Williams, and had begun an enviable record of giving early leadership to colleges and universities in America. As now organized it includes the undergraduate schools —Yale Coll. (1701), School of Engineering (1932), and the freshman year (1920), which is common to both; also the Graduate School (1847), whose instruction in science and mathematics is given by the faculty of the Sheffield Scientific School (1854), the School of Medicine (1813), Divinity School (1822), School of Law (1824), School of the Fine Arts (1865), School of Music (1894), School of Forestry (1900), and School of Nursing (1923).

Freshmen live together on the old Yale campus which borders the New Haven Green. Upper classmen live in 10 undergraduate colleges, each of which accommodates about 200 students, has its own dining hall and library, and studies for members of the faculty assigned as fellows to that college. The house of the master of the college adjoins the quadrangle. This plan for preserving the values of the small college within a large university was made possible by the gifts of Edward S. Harkness, '97, and was inaugurated in 1933.



Courtesy Connecticut Development Com.

YALE UNIVERSITY. HARKNESS TOWER

The Yale library contains more than 3,500,000 volumes. Famous collections are to be found in the Peabody Museum of Natural History and the art gallery. The endowment is over $123,000,000. The annual attendance is about 5,300 students in normal times. Among famous alumni are Nathan Hale (1733), Noah Webster (1778), Eli Whitney (1792), Benjamin Silliman (1796), James Fenimore Cooper (1806), Samuel F.B. Morse (1810), Josiah Willard Gibbs (1858), William Howard Taft (1878), and Henry L. Stimson (1888).

Yalta (*yäl'tä*), Russian seaport and resort in the Crimean Autonomous Soviet Socialist Republic, on the southern coast of the Crimean Peninsula, about 35 m. E. of Sevastopol. Surrounded by a region of low mountains yielding cypress, olives, figs, grapes, and tobacco, the city has a warm dry climate. Called the "Pearl of the Crimea," the city is dotted with health resorts, sanatoriums, and hotels, as well as with architectural vestiges of several ancient civilizations, including the Scythian and the Greek. Among the noteworthy buildings are the summer palace of the former Czar Nicholas II at Livadia, where the Crimea Conference (*q.v.*) of the "Big Three" took place in 1945; the Museum of Regional Studies, the Central Inst. of Climatology and Climatotherapy, and the All-Union Inst. of the Tobacco Industry.

Throughout history the region was overrun by warlike hordes, and successively pillaged and destroyed by the Goths, Huns, Greeks, and Mongols. In 1783 it was annexed to the Russian Empire. It was the scene of the Crimean War of 1854-56, and during World War II Yalta was largely destroyed and captured by the Germans in their drive toward Sevastapol. The city was retaken by the Russians on April 16, 1944. Population, *ca.* 29,000. See *Crimea Conference.*

Yalu (*yä'lōō'*), Korean name, AMNOK, a river in eastern Asia, forming the boundary between Korea and Manchuria. Flowing in a general southwesterly direction, it empties into Korea Bay, near Antung, after a course of *ca.* 480 m. During the Russo-Japanese War, in a battle fought on May 1, 1904, the Japanese crossed the river near its mouth and inflicted a heavy defeat on the Russian forces. During the Korean war, the Yalu marked the furthest advance of U.N. forces; it also marked the line beyond which U.N. pilots were forbidden to pursue Communist aircraft, so as not to provide the Communist powers with any pretext for widening the conflict.

Yam (*yăm*), the common name of several species of tropical vines in the genus *Dioscorea* of the yam family. They produce large, underground roots, weighing up to 40 lb., which are important as a food in their native regions. One kind, the cinnamon vine, is grown in the U.S. as a decorative garden vine. Recently, a wild species of Mexican yam has been found to be an important source of substances similar to human sex hormones and usable as substitutes for the much more expensive derivatives from animal glands.

As a food, yams have much the same qualities as potatoes and are cultivated in similar fashion, although the roots grow much deeper in the soil. In the U.S., the name yam is applied to some sweeter and softer varieties of sweet potato.

Yamasee (*yä'mą-sē*), also YAMASI, or YEMASEE, an Indian tribe of Muskhogean stock once found in Georgia, now living in Florida. In 1715 they rebelled against the English and, after killing several hundred settlers, were defeated by Gov. Charles Craven of South Carolina. Many withdrew to Florida, settling near St. Augustine. Their village was destroyed by the English in 1727, and those not killed were enslaved by the Seminole. They were such proficient canoe men that a style of paddling adopted from them has been named the "Yamasee stroke." Only a few Yamasee Indians survive today.

Yamashita (*yä-mä-shē-tä*), TOMOYUKI, general, born in Kochi Prefecture, Japan, 1885; died in Luzon, P.I., Feb. 23, 1946. Educated at military academies in Japan and Germany, he entered the Japanese army, and, in 1939, he commanded the Japanese forces in Manchuria. He led the Japanese invasion of Malaya and received the surrender of Singapore in February 1942. The next month he took command in the Philippines, capturing Bataan and Corregidor. After leading (1942-44) Japanese forces in China, he returned to the Philippines. He surrendered in 1945 and, later, was convicted (by a U.S. military court) and hanged for atrocities committed by his soldiers.

Yancey (*yăn'sĭ*), WILLIAM LOWNDES, lawyer and politician, born in Ogeechee Shoals, Ga., Aug. 10, 1814; died near Montgomery, Ala., July 27, 1863. He was admitted to the bar in South Carolina and moved (1836) to Alabama, which he represented in Congress (1844-46). He was an extreme advocate of Southern secession; however, he later turned down an offer to serve in the cabinet of Jefferson Davis (*q.v.*). In March 1861 he was sent to Europe as head of a commission to secure recognition of the Confederacy. Failing in this mission, he returned to America and became a member of the Confederate senate.

Yangtze (*yăng'tsê*) or YANGTZE-KIANG, the largest river in China. Rising in the Kunlun Mts. of Tsing-hai province, it flows south through Sikang province, then east through central China to the East China Sea. Its entire length is about 3,435 m. Many of China's most important and populous cities are located on its banks, among them Chungking, Hankow, Wuchang, Nanking, and Shanghai. Its major tributaries are the Han and Kialing rivers, and it is connected by canal with the Yellow River (Hwang Ho). The Yangtze is navigable by river steamers for about 1,500 m. from its mouth. Its valley is highly fertile, producing rice, cotton, tobacco, fruit, and vegetables.

Yank (*yăngk*), a weekly magazine published specifically for the members of the armed forces during World War II. Published first in New York City, on June 13, 1942, it was expanded during the course of the war to include one domestic and several foreign editions. As a new theater of operations was established a new edition of *Yank* was undertaken. Publication was suspended on Dec. 13, 1945.

Yankee (*yăng'kē*), a name popularly applied in the U.S. to people residing in or coming from New England. In Canada, Europe, and South America, however, it is used for all the people of the U.S. The name originated from a misunderstanding of the word *English* by the Indians, who pronounced it *yanghies* and *yenghies,* and finally coined the word *yankees.* The British soldiers applied it, as a derogatory term, to the New England troops, in 1775, and the New Englanders subsequently took up the name as a term of local pride. In the Civil War it was generally applied to the Northern people by those residing in the Southern states, while the latter became known as *Johnnies.*

The shrewd but slightly crude Yankee was a popular character in 19th-century American drama. The stage Yankee appeared first as *Jonathan* in Royall Tyler's "The Contrast" (1787), the first U.S.-written comedy. Other popular stage Yankees were *Jonathan Ploughboy* (in Samuel Woodworth's "Forest Rose, or American Farmers"), *Solomon Swap* (in an adaptation of "Who Wants a Guinea?" from the work by George Col-man the younger), and *Solon Shingle* (in J. S. Jones' "The People's Lawyer"). Well-known Yankee impersonators were James H. Hackett, George Handel Hill, Dan Marble, and Joshua S. Silsbee.

Yankee Doodle (*yăng′kē dōō′d′l*), an American patriotic song, sung to a traditional tune. Its origin has never been fully established, but the tune "Yankee Doodle" was played by the British troops at the time of the Revolution in derision of the New Englanders, who afterward adopted it as a popular air. "I'm a Yankee Doodle Dandy" is a famous song by George M. Cohan (*q.v.*).

Yankton (*yăngk′tŭn*), county seat of Yankton County, South Dakota, on the Missouri River, 60 m. N.W. of Sioux City, Iowa. It is on the Chicago & North Western, the Great Northern, and the Milwaukee R.R.'s. The principal manufactures include machine-tool parts, stock feed, and processed bakery and dairy products. Yankton Coll. and Mt. Marty Coll. are located here. First settled in 1858 and incorporated in 1862, the town was the capital of Dakota Territory (1861-83). Population, 1950, 7,709.

Yankton, one of the seven primary divisions of the Dakota, a North American Indian tribe of the Siouan linguistic family. When first discovered, the tribe lived north of Mille Lac, Minn., but by the beginning of the 18th century they had migrated to the east bank of the Missouri River in the vicinity of the site of Sioux City, Iowa. For a century and a half they roamed the regions of the James, Big Sioux, Floyd, and upper Des Moines rivers and dealt with traders along the Missouri. In 1858 they ceded all their lands to the U.S., except for a reservation on the north bank of the Missouri, in South Dakota. In 1950 there were 2,391 Yankton living on the reservation.

Yap (*yăp*), a coral island in the western Pacific Ocean, one of the westernmost of the Caroline Islands (*q.v.*). Yap, a cable station on the trans-Pacific line, is about 80 sq. m. in area and very hilly. Of great interest to archaeologists are the many stone platforms, circular pieces of stone money, and other relics left by ancient inhabitants of the island. Population, *ca.* 6,500.

Yaqui (*yä′kē*), a North American Indian tribe, forming an important division of the Cahita of the Uto-Aztecan linguistic stock. They formerly occupied both banks of the lower Rio Yaqui but are now scattered over the larger part of southern Sonora, Mexico. During the last 50 years a considerable number migrated to southern Arizona, where they are employed in urban and industrial areas. The Yaqui are noted for their warlike nature and are purported to be the only North American tribe that has never been fully subdued; but, except for their language, they have in the main become largely Hispanized. Their principal industries are agriculture and cattle raising and the manufacture of cotton and woolen goods.

Yarkand (*yär-känd′*), a river in central Asia, forming part of the border between Sinkiang Province, China, and the territory of Kashmir. Rising in the Karakorum Mts., it flows about 500 m. in a northeasterly direction through Sinkiang and joins the Khotan to form the Tarim River. Located on the banks of the Yarkand is the city of Yarkand (population, *ca.* 60,000), an important trading center on the southern caravan route across Chinese Turkestan.

Yarmouth (*yär′mŭth*) or GREAT YARMOUTH, a seaport and watering place in Norfolk, England, *ca.* 120 m. N.E. of London and 20 m. E. of Norwich. It is situated at almost the extreme easterly point of the British Isles on the mouth of the Yare River, with excellent railway facilities. It is the largest herring port in Great Britain. Other industries are shipbuilding, marine engineering, silk textiles, garments, oilskins, chemical fertilizers, and foodstuffs. The town suffered greatly from air raids during World War II, and the 12th-century church of St. Nicholas was gutted in 1942 by incendiary bombs. Population, 1951, 51,105.

Yaroslavl (*yà-rŏ-slä′v′l*), a city in western U.S.S.R., in the Russian Soviet Federated Socialist Republic, about 165 m. N.E. of Moscow. Located on the Volga River, it is the capital of Yaroslavl region (area, *ca.* 14,250 sq. m.; population, 1939, 2,271,307). The manufactures include automobiles and trucks, tires, paints, textiles, and machinery. A law school and several professional institutions are located in the city. Yaroslavl was founded *ca.* 1026 and has been under Russian rule since the 15th century. Population, 1939, 298,065.

Yarrow (*yăr′ō*), a common weedy plant of the composite family, *Achillea millefolium*, originally introduced into the U.S. from Europe. Its leaves are very finely divided into narrow segments. The flowering stalk grows 1 to 2 ft. high, with a large, flat-topped cluster of small, usually white flowers. Yarrow grows as a weed along roadsides, sometimes in lawns, in every part of the U.S. and Canada, except the Far North. Pink and red varieties are sometimes cultivated in gardens.

Yates (*yāts*), EDMUND HODGSON, novelist and journalist, born in Edinburgh, Scotland, July 3, 1831; died there, May 20, 1894. Educated in London and Düsseldorf, he entered the British postal service but retired in 1872 to engage in literary work. From 1873 to 1875, after a successful lecture tour in America, he was European correspondent of the New York *Herald*. As a columnist for the London *Illustrated Times*, he wrote the first gossip column in the history of periodicals, and later, as editor of the magazines *Town Talk* and *The World*, he further developed this innovation. He was expelled from a London club for a scurrilous attack on W. M. Thackeray, and, in 1885, he was convicted of libel for an item on the Earl of Lonsdale in one of his columns and served a term in prison. He was the author of a number of novels and other works, the best known of which include: "Edmund Yates: His Recollections and Experiences," "Broken to Harness," "The Black Sheep," "Dr. Wainwright's Patient," and "The Impending Sword."

Yates, RICHARD, governor of Illinois, born in Warsaw, Ky., Jan. 18, 1818; died in St. Louis, Mo., Nov. 27, 1873. He attended Illinois Coll., at Jacksonville, and in 1838 began the practice of law at Springfield. In 1842 he became a member of the state legislature, serving until 1849, when he was elected to Congress as a Whig. He was elected governor of Illinois in 1860 and re-elected in 1862. As a war governor he aided in raising Federal troops, and early recognized the military ability of Ulysses S. Grant. He served as U.S. Senator from 1865-71, and was chosen railroad commissioner shortly before his death.

Yates, ROBERT, jurist, born in Schenectady, N.Y., Mar. 17, 1738; died in Albany, N.Y., Sept. 9, 1801. He attended school in New York City, studied law under William Livingston, and was admitted to the bar in 1760. He settled in Albany, and became a member of the provincial congress, in 1775. He was chief justice of the New York supreme court from 1790-98 and subsequently served on commissions to settle territorial disputes between various states.

Yaws (*ya̤z*), or FRAMBESIA, a common infectious and contagious disease prevalent in many tropical regions. It is caused by a microbe of the spirochete group called *Treponema pertenue*. Characteristically there is an initial lesion of the skin, often at the site of a pre-existing slight wound or ulcer (*q.v.*), usually on the legs, followed after one to three months by shedding of small bits of skinlike dust, and then soon followed by widespread raspberrylike lesions. Bone and joint pains are common, and frequently infections of bone with the spirochete are observed. The disease becomes chronic, and may last for months or years, with frequent relapses. The lesions become yellowish granular tubercles, most common on the soles of the feet, giving rise to the condition called "crab yaws" because of the resulting difficult and peculiar manner of walking. The infection is transmitted from the discharges of the sores on the affected person to others either by direct contact or by flies. There is no racial immunity to yaws, but Negroes are more commonly infected than are white people. Complete recovery from an attack does not confer immunity to reinfection. Treatment consists of administration of arsenicals and other heavy-metal medications. Prevention by adequate personal prophylaxis, avoidance of contacts, and public education in the areas of prevalence, especially the Caribbean area, is important.

Yazoo (*yăz'o͞o*), a river in Mississippi, which rises in the northern part of the state, near Friarpoint, from several bayous thrown off by the Mississippi River. Later it is joined by the Yalobusha and the Tallahatchie and, after a general course toward the southwest, it flows into the Mississippi 10 m. above Vicksburg. It is about 300 m. long and has a rather tortuous course, but is navigable at all seasons. Fertile cotton plantations are located along its banks. Yazoo City is the chief city on its banks.

Yazoo City (*yăz'o͞o sĭt'y̆*), county seat of Yazoo County, Mississippi, on the Yazoo River, 45 m. N.W. of Jackson. It is on the Illinois Central R.R. It is surrounded by a fertile farming country, which produces large quantities of corn, beef cattle, hogs, and cotton. The industries in Yazoo City include a petroleum refinery, lumber mills, and machine shops. The city was incorporated in 1830. Population, 1950, 9,746.

Year (*yēr*), the period of time in which the earth completes a revolution around the sun, or in which the seasons pass through their changes. The period between two passages of the sun through the same equinox, which determines the changing seasons, is called the *solar, tropical,* or *equinoctial* year, and is constituted of 365 days, 5 hours, 48 minutes, and 46 seconds. The *sidereal* year, in which the sun apparently returns to the same stars, is equal to 365 days, 6 hours, 9 minutes, and 9 seconds. It differs in length from the tropical year, owing to the precession of the equinoxes among the stars. The *common year* of 365 days, the integral number of days nearest to the solar year, is in popular use, and every fourth year is a *leap-year* of 366 days, except the centuries not exactly divisible by 400, as 1800 and 1900. Other years include the *civil year* of 365 days, the *lunar year* of 12 lunar months, and the *ecclesiastical year* counted from Advent to Advent.

Yeast (*yēst*), a fungus growth consisting of minute vegetable cells that collect and form a frothy substance of a yellowish color. When placed in contact with sugary or starchy liquids, it develops or increases by germination, producing, as a product of its life-processes, alcoholic fermentation and carbonic acid. Yeast is employed chiefly in the brewing of beer and the raising of bread. In the former it imparts the sparkling and alcoholic qualities to the beer, while the carbonic acid causes porosity in the bread. A quantity of yeast is mixed with the dough, which is allowed to stand and rise for some time, and the dough is then made into loaves. The action of yeast is to produce a small quantity of alcohol and carbonic acid from the sugar present in the dough, the rising being due to the escaping carbonic acid. Yeast in various forms is now used largely in all classes of baked goods, although in the East, as in former times, *leaven* (dough impregnated with yeast) is still employed to a considerable extent. In Canada, the U.S., and many countries of Europe *baḳing powders* are used extensively as a substitute for yeast in bread making.

Yeast, in either the baker's or brewer's form, is an excellent natural source of the vitamins (*q.v.*) of the B complex. It has been used for years by physicians in the treatment of certain vitamin deficiency conditions and as a sort of tonic or appetite "booster." Nowadays special extracts or concentrates of yeast are used as potent sources of the B vitamins. Fresh yeast also aids in the digestion and absorption of certain carbohydrate foods by the action of certain natural enzymes (ferments) which it contains.

Yeats (*yāts*), WILLIAM BUTLER, dramatist and poet, born in Sandymount, near Dublin, June 13, 1865; died Jan. 28, 1939. The son of an artist who early moved from Dublin to London, Yeats divided his early years between Ireland and England. At his father's request, he studied painting for three years, but he preferred to translate Gaelic or listen to Irish folk tales. He renounced painting in 1886 in favor of literature. In 1897, he was engaged as a journalist in London, and, in 1894, he met Verlaine in Paris. After his return to Ireland in the early years of the century, he and Lady Gregory established the Irish Literary Theater, which soon became the Abbey Theater, a focal point for the "Irish Renaissance." In later years, he married Georgie Lees (1917), served as a senator of the Irish Free State (1922), and won the Nobel Prize for literature (1923). His "Autobiographies" (1926) included "Reveries Over Childhood and Youth" and "The Trembling of the Veil." During the same year, the first collected edition of his works appeared. Also in 1926, he published "Visions," a work which he later ascribed (in "A Packet for Ezra Pound," 1929) to his wife's spiritualistic powers. His last years were lived with his wife and two children in an ancient tower on the Irish coast.

Yeats's dramatic works, presented in terms of tragic or tender symbolism, reflect the moral character of the Irish people. The dramas in verse include: "Mosada" (1886), "The Countess Kathleen" (1892), "The Land of Heart's Desire" (1894), "The King's Threshold" (1904), and "Deirdre" (1907). Among the prose dramas are: "Cathleen Ni Houlihan" (1902) and "The Hour Glass" (1903).

The imaginative and mystic qualities of his lyric poetry stem from Celtic and Hindu sources, and are also drawn from such poets as William Blake and the French symbolists. Yeats's early poems were subtle and ethereally graceful, but, as he grew older, they became increasingly intellectual. His reputation as a lyricist was first established with "The Wanderings of Oisin" (1889). Other volumes include: "The Wind Among the Trees" (1889), "In the Seven Woods" (1903), "The Green Helmet" (1910), "The Wild Swans of Coole" (1919), "The Tower" (1928), and "The Winding Stair" (1929). Yeats sought truth through the medium of mystic intuition, blending Irish, British, and European traditions. He is regarded by many as the foremost lyric poet of modern English literature.

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WILLIAM BUTLER YEATS

Yedo (*yĕ-dô*) or YEDDO. See *Toḳyo.*

Yellow (*yĕl′ō*), the color of the solar spectrum between orange and green. It is best represented by the lemon and canary yellow, and is the color of gold and of brass. Violet and yellow are complementary to each other, that is, if these two colors are mixed they will produce white light. Blue is made paler by increasing the light to which it is exposed, but an increase of light seems to strengthen the color of yellow.

Yellow Bird (*yĕl′ō bẽrd*), an American bird of the finch family, which is widely distributed in North and Central America. It is about 6 in. long, with a wingspread of 9 in. The male has bright yellow plumage in summer, while the female is yellowish brown. A number of species have been catalogued. They feed on insects and seeds.

Yellow-Dog Contract (*yĕl′ō-dôg′ ḳŏn′trăḳt*), an agreement between an employer and employee in which, as a condition for employment, the latter undertakes not to join a labor union. The practice of coercing workers into signing yellow-dog agreements was long resented by labor and condemned as an unfair practice. In 1932, Congress passed the Norris-LaGuardia Act outlawing yellow-dog contracts in all cases under Federal jurisdiction. See also *Labor Injunction.*

Yellow Earth (*yĕl′ō ẽrth′*). See *Ocher.*

Yellow Fever (*yĕl′ō fēv′ẽr*), an acute, specific disease, epidemic in tropical countries. It first became known to Europeans in the 16th or 17th century in connection with the discovery of America, and was so named from the resulting yellow appearance of the victims' skin. Yellow fever is caused by a specific filterable virus, which becomes complicated with jaundice conditions. It never spreads when the temperature is lower than 70° F., and its spread immediately stops when the temperature falls to the freezing point.

Clinical recognition of yellow fever usually depends on a sudden onset of symptoms, fever, prostration, slow pulse relative to the body temperature, severe headache and backache, congestion of the mucous membranes with bleeding gums, black vomiting in severe cases, late jaundice (yellowing of the skin and whites of the eyes), and brief duration of illness. Large amounts of albumen in the urine and a decrease in the white blood cell count are characteristic laboratory findings.

In 1897 J. Sanarelli, of Montevideo, Uruguay, published the opinion that yellow fever is a toxic disease, induced by a poison generated by the bacillus *icteroides*, which he named *amaril*. Mosquitoes as carriers of yellow fever were discovered by Walter Reed (*q.v.*) and his associates in 1901. The causative germ was discovered by Noguchi in 1918. The specific bearer is the species of mosquito, *Aedes aegypti*. Infection takes place when the blood of a yellow-fever patient is transmitted to a healthy person by a mosquito. Horses, cattle, monkeys, rats, and many other animals are subject to it.

There is no natural immunity to yellow fever; however, recovery from an attack of the disease is followed by an apparently lifelong immunity. A brief artificial immunity may be provided by use of convalescent serum. Immunity lasting several years is developed by injection of yellow-fever vaccine. Sanitary measures are effective preventives.

The disease is most prevalent in Central America, the West Indies, portions of Mexico, and the tropical countries of Africa. It is frequently carried to the Gulf states and elsewhere in America.

Occasionally cases of a variety of the disease, called *jungle fever*, occur in parts of Central and South America, where the virus is carried in the blood of certain species of monkeys and transmitted to man by the mosquito.

Yellowhammer (*yĕl'ō-hăm-ēr*), a common European bird related to the finch and bunting, most often found in wooded districts. It is ca. 7 in. long, and the male has a bright yellow throat, breast, and abdomen. American varieties measure from ca. 8 in. to ca. 1 ft.

Yellow Jacket (*yĕl'ō jăk'ĕt*), in zoology, an American wasp notorious for its sting. Part of its body is of a bright yellow color. In botany, a yellow jacket is a eucalypt with a yellow bark; it grows in Australia.

Yellowlegs (*yĕl'ō-lĕgz*), the name of two species of snipes found in North America, especially along the Atlantic coast. The common *yellowlegs* is 10 in. long and is much prized for its flesh; hunting has almost exterminated the species. The *greater yellowlegs* is somewhat larger. These birds migrate north as far as Nova Scotia and in autumn pass south to the West Indies and South America. Hunters sometimes call them *tattlers*, or *yelpers*, owing to their peculiar noise when fleeing from danger.

Yellow Pine (*yĕl'ō pīn*) or GEORGIA PINE, an important timber tree. See *Pine*.

Yellow Press (*yĕl'ō prĕs*), term descriptive of newspapers which present the news in a highly sensational manner. This style of journalism was developed by Joseph Pulitzer in the New York *World* and was further developed by William Randolph Hearst (*q.q.v.*). Sensational handling of the news and such features as political cartoons, comic strips, and tremendous headlines were used. The *World's* Sunday edition featured a comic strip in which the principal character was a "yellow kid," and the newspaper's supplements were printed on colored stock, giving rise to the term "yellow journalism."

Yellow River (*yĕl'ō rĭv'ēr*), or HWANG HO, the second-longest river in China. Rising in Tsinghai Province, it pursues a widely looping course eastward for ca. 2,700 mi. to its mouth on the Gulf of Po Hai. The river's yellow color is derived from the silt it picks up in loess (*q.v.*) regions and deposits as a fertile delta at its mouth. The heavy silt deposits have raised the river bed above the rest of the countryside, causing frequent changes in the river's course and such disastrous floods that the river is called "China's Sorrow." Its chief tributaries are the Wei and the Fen.

Yellow Sea (*yĕl'ō sē*), an extensive inlet of the Pacific Ocean, lying between Korea and China and merging into the Gulf of Po Hai. It is 600 mi. in length, 400 mi. wide, and is largely a shallow expanse of the sea. This is due to the large amount of silt carried into it by the Yangtze Kiang and Hwang Ho. Shanghai, Kiaochow, and Seoul are the chief cities on the Yellow Sea, and Port Arthur and Tientsin are on the Gulf of Po Hai. It has valuable fisheries.

Yellowstone (*yĕl'ō-stōn*), a river of the U.S. It rises in the Absaroka Mts., a range in the northwestern part of Wyoming, and takes a general course toward the north. The river passes through Yellowstone Lake and Yellowstone National Park until it reaches Livingston, Mont., where it assumes a northeasterly direction and flows into the Missouri River near the boundary of Montana and North Dakota. The chief tributaries are the Powder and Bighorn rivers, which rise in Wyoming. The Yellowstone is 671 mi. long and a portion of this is navigable for small vessels. Below Yellowstone Lake, the river plunges over two precipices, the upper one having a fall of ca. 109 ft. and the lower one of ca. 308 ft. Below the falls is the Grand Canyon of the Yellowstone (1,200 ft. deep).

Yellowstone Lake is ca. 20 mi. long and ca. 300 ft. deep, and has an area of ca. 139 sq. mi. It is 7,731 ft. above sea level, one of the world's largest bodies of water at such a high altitude. The lake has an abundance of fish, and its shores are picturesque.

Yellowstone National Park (*yĕl'ō-stōn năsh'ŭn-al pärk*), the largest and oldest national park in the U.S. It is situated principally in the extreme northwestern part of Wyoming; however, a small strip along the western side is in Idaho, and a portion of the northern part is in Montana. The reservation was set apart as a public park by the national government in 1872. It has an area of 3,472 sq. mi.

The park has an abundance of rainfall, giving it beautiful ponds and lakes, numerous streams, and excellent vegetation. Yellowstone, Shoshone, Lewis, and Heart Lakes are the chief bodies of water, and the principal drainage is by the Yellowstone River. The Madison River, a tributary of the Missouri, drains the western part, and the Snake River, a tributary of the Columbia, has its source in the southern part. This park contains some of the most beautiful natural curiosities in the world, including waterfalls, geysers, and hot springs. Many of the springs are laden with minerals, such as the Mammoth Hot Springs, which are situated near the northern entrance to the park. Although the general surface ranges from 6,580 to 8,500 ft. above the sea, some peaks exceed 10,000 ft. in altitude.

The Grand Canyon of the Yellowstone, with its vast volume of water rushing to great depths; its many snow-capped mountains; the Grand, Old Faithful, Giant, Giantess, and Bee-Hive geysers; and numerous cascades and waterfalls, contain some of the most beautiful scenery in the country. In this great natural zoological garden are beautiful forests, in which are protected herds of buffalo, deer, elk, antelope, and other animals. The government has planted whitefish and other species in the lakes and rivers.

The park is reached most conveniently from Livingston, Mont., by the Northern Pacific R.R., which has its terminus at Gardiner, a small town at the northern boundary of the park. Other gateways are reached from Cody, Wyo., and from Monida, Ida.

Yemen (*yĕm'ĕn*), a monarchy in Arabia (q.v.). It is bounded on the N. and E. by Saudi Arabia, on the S. by Aden Protectorate, and on the W. by the Red Sea. The area is about 75,000 sq. mi. The country has a mountainous terrain, with valleys rich with tropical and subtropical vegetation. The coast is hot and arid during most seasons of the year. Yemen has a flourishing agriculture, and coffee is a major export. Cereals and fruits are also grown, and stock raising is widespread. Hides are also exported. Commerce is carried on in the nominal capital Sana, the largest city, the port of Hodeida, and in Lohaiya. Ta'izz is the seat of government.

Yemen is an independent state under a ruler, the Imam Ahmad, who exercises religious and temporal functions. He succeeded his father, the Imam Yahya, in 1948. There is a cabinet appointed by the Imam. The unit of currency is the riyal.

Yemen shared the history of the rest of Arabia until about the 9th century A.D., when it broke away from the Abbassides (q.v.). Except for the eight-century rule of the Turks (ended by World War I) thereafter remained largely independent under its native imams (see IMAM). Its post-World War I boundary disputes with Saudi Arabia and Aden were settled in 1934. Imam Yahya was murdered in 1948 during a coup d'état. Yemen was a founding member of the Arab League (q.v.), joined the U.N. in 1947, and was tied to the United Arab Republic (q.v.), 1958–61. Population, 1957 (est.), 4,500,000.

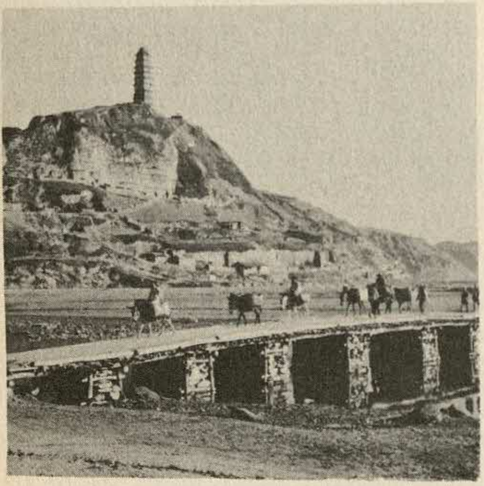
Yen (*yĕn*), a coin of Japan, the monetary unit of that country. It was minted in both gold and silver until 1897, when the gold standard was

Photo by H. H. Pierce, courtesy Natl. Park Service

YELLOWSTONE NATIONAL PARK

adopted, and since that time it has been coined chiefly in larger denominations than the single yen. A yen is divided into 100 *sens,* which are coined in bronze. The coin of 5 sens is coined in nickel; the 10-sen, the 20-sen, and the 50-sen pieces are in silver. The sen is divided into 5,000 *rin,* and this is coined in bronze in the denomination of 5 rins. After the occupation of Japan in 1945, the yen had no official exchange value until 1949. In April 1949 the Supreme Commander for the Allied Powers set the value of 360 yen to one dollar U.S.

Yenan (*yĕ′nän′*), or FUSHIH, a city of China, located in Shensi Province on the Yen Shui River, halfway between Sian and the Great Wall of China. Almost three-fourths of the city's population is made up of soldiers, students, and workers of the Chinese Communist party, of which Yenan is the official headquarters. Yenan has the highest literacy rate of any city in China, despite the fact that it has no electricity or modern machinery. A great number of the city's buildings were built into mountain-side caves as a protection against bombing during the civil war. Yenan Univ., the official school of the Communist party, is located here. Barter is the main form of commerce, with the chief crops being tomatoes, corn, and tobacco. Population, 1945, 40,000. See also *Chinese Republic.*



Courtesy China Aid Council, N. Y.

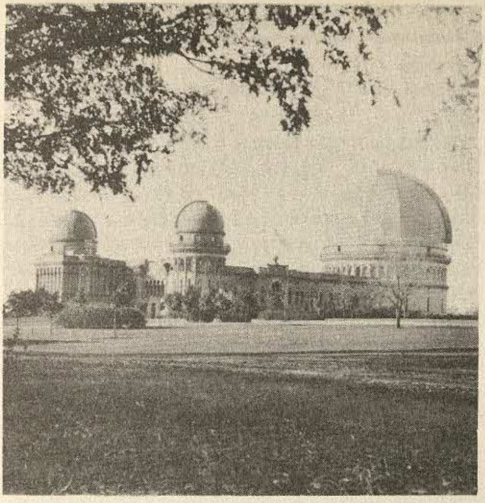
TRANSPORT CARAVAN AT THE ENTRANCE TO YENAN

Yenikale (*yĕn-ē-ķȧ-lä′*), STRAIT OF, a narrow passage which separates the western extremity of the Caucasus from the Crimean Peninsula and forms the connection between the Black Sea and the Sea of Azov. The strait is 25 m. long and about 3 m. wide at its narrowest place. It contains numerous shoals. In the central part is an expansion, known as the Harbor of Kerch, and the stretch south of it is usually called the Strait of Kerch.

Yenisei (*yĕn-ē-sä′ē*), an important river of Asia, which rises in northern China by two branches, the Bev-Keme and the Onlon-Keme, and flows into the Gulf of Yenisei, an inlet of the Arctic Ocean. The upper course is toward the west, but it assumes a general course toward the north near the boundary of Siberia and, after receiving the Upper Tunguska, flows toward the northwest. In its upper course are a number of falls and rapids, but the larger part of the Yenisei flows through great steppes. It receives numerous tributaries. It is navigable only in the summer months, owing to the cold climate. It has a total length of about 3,000 m. The basin contains 1,100,000 sq. m. The Angara River, which merges into the Upper Tunguska, is the outlet of Lake Baikal. The Yenisei is navigable to Turukhansk.

Yerkes (*yûr′ķēz*), CHARLES TYSON, capitalist, born in Philadelphia, Pa., June 25, 1837; died in New York City, Dec. 29, 1905. He attended schools in Philadelphia, began business as a clerk in the grain commission trade, and in 1858 opened an office as an exchange broker. In 1861, he went into the banking business, dealing extensively in bonds, and, in 1871, failed in business. He was convicted of misappropriating public funds and for a time was in prison, but was afterward released. He profited by the failure of Jay Cooke in 1873, and invested in the street railways of Philadelphia. In 1886, he secured control of the North Side and West Side street railroads and the elevated railway corporations of Chicago, which he improved and enlarged. He was a director of the World's Columbian Exposition, Chicago, and made a loan of his private collection of paintings to the department of fine arts. Subsequently he financed and managed an extensive line of underground railways in London. He made a gift of $400,000 to the Univ. of Chicago, to establish at Lake Geneva, Wis., the Yerkes Observatory (*q.v.*).

Yerkes Observatory (*yûr′ķēz ŏb-zẽr′vȧ-tō-rў̆*), the astronomical observatory of the Univ. of Chicago, located at Williams Bay, Wis. A gift (1892) of Charles T. Yerkes (*q.v.*) of Chicago to the newly created Univ. of Chicago, the observatory was planned by astronomer George E. Hale and was located well away from the smoke and the interfering lights of the city, on a hill overlooking Lake Geneva at Williams Bay. It contains a refracting telescope with a 40-in. objective glass, the largest lens ever successfully used for astronomical investigation. With this instrument has been done much pioneering work in many phases of astronomy. Several other types of smaller telescopes are also used. For over



YERKES OBSERVATORY

half a century this institution has maintained high standards in research as well as in graduate instruction.

Yesso (*yĕs′sō*), JESSO, or YEZO, the most northerly of the principal islands included in Japan. It is separated from Nippon by Tsugaru Strait. The island is mountainous and volcanic, but has excellent timber and fine minerals. Mt. Tokachidake, height 8,210 ft., is one of the highest peaks. The Ishikari, length 407 m., is the chief river. Among the minerals are gold, silver, iron, and coal, and there are valuable fisheries in its streams and off the coasts. Sheep, cattle, horses, and cereals are grown in abundance. Yesso has an area of 36,299 sq. m. and a population of *ca.* 1,000,000. Hakodate is the chief city and the capital.

Yew (*yū*), an evergreen tree with spreading branches, solid and massive trunk, and dense, dark green foliage. Naturalists have catalogued many species, all of which yield wood of a fine, close grain, which is very durable and valuable for architectural and manufacturing purposes. Many species are now cultivated, especially as ornamental trees, either for separate growth or for hedges. The best known species include the *California yew, Mexican yew, Irish yew,* and *Japan yew.* Yew trees have a slow growth and a long life, some species attaining an age of 300 to 500 years, and the leaves contain a potent narcotic principle. The yew tree is commonly called hemlock, and the poisonous properties are referred to in the classical writings of Virgil, Livy, Plato, and Caesar. Though poisonous to some extent when in a state of growth, the leaves develop a larger percentage of poison when undergoing fermentation in large piles or heaps.

Ygdrasil (*ĭg′drȧ-sĭl*), in Scandinavian mythology, the name of the most sublime of all trees, the ash, whose branches were supposed to reach from earth to heaven. It was regarded as the symbol of the universe. The fountain of wisdom was beneath one of its roots, and under its boughs was a familiar meeting place of the gods. Some writers regard it as the source of the Christmas tree.

Yiddish (*yĭd′ĭsh*). See *Jews:* LANGUAGE.

Yield (*yēld*), a term in commerce designating the income from investments or property, especially from bonds bought as investments to be held until maturity, as distinguished from *return,* which denotes current income from a stock or bond.

Yodel (*yō′d'l*), a specific kind of singing, especially as practiced in the Tyrol and Switzerland. With rapid alternations between head and chest notes one person calls from one peak in the mountains to another.

Yoga (*yō′gȧ*), a partly philosophical, partly theological system which demands that its adherents, called *Yogi,* strive for concentration of will in order that they may become completely free and open for the working of consciousness and mind. Although there are some practitioners of Yoga in the Western world, they are ordinarily more interested in its system of physical and spiritual discipline than in agreement with its specific religious teachings, which for the most part developed in India and flourish there.

The basis of the Yoga system is the Yogasutras of Patanjali, the author of Maha-Bhashya, the famous Sanskrit "Great Commentary," written in the 2nd century B.C. Patanjali himself goes back to the Sankhya system, which originated before Buddha. For him, two categories exist, the dualism of Prakrite (matter) and Purusha (soul). In the Sankhya-Yoga system, a personal god is supposed to exist in contrast to the original Sankhya. The Yogasutras helps in attaining knowledge, so that finally the separated categories of matter and soul may be connected to such a degree that the soul can influence matter, or, to a certain extent, even negate it. If this stage is achieved, the Yogi are able to practice miracles, although typical Yoga miracles of which all Indian travelers tell are often nothing more than the tricks of magicians. These miracles, which sometimes seem to contradict natural laws, do not represent the real achievement of Yoga, however: the real goal is attainment of universal knowledge and, as an outgrowth of it, perfect balance and peace of mind.

There are eight steps in the preparation for the final stage of Yoga, some of them spiritual, some of them physical (*e.g.,* certain methods of breathing, the withdrawal of all senses from reaction to worldly stimuli, and finally higher stages of consciousness).

Although the combination of physical exercises and higher mental activities, typical of the Yoga system, seem peculiar to the Western mind, there is no doubt that these physical preparations are an excellent training for the development of will power and concentration and thus are actually helpful in spiritual contemplation.

The Yoga system cannot be held responsible for the plagiarisms of many charlatans, whose half-educated followers have no grasp of its intellectual or philosophical contents, although they copy some of its physical exercises.

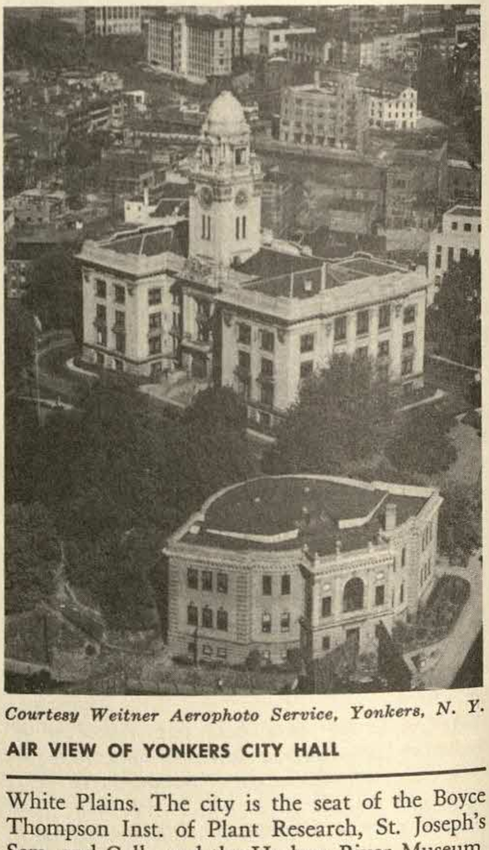
Yokohama (*yō-kô-hä'mä*), a large port and industrial city of Japan, in the island of Honshu, 18 m. s.w. of Tokyo. It has good railroad facilities and a commodious harbor on Tokyo Bay. Before World War II it was noted as a trade and manufacturing city. Among the principal manufactures were embroidery, clothing, porcelain, leather, silk and woolen textiles, soap, edged tools, hardware, and machinery. It had a large trade in rice, silk, woollens, tea, cotton, and porcelain. The noteworthy buildings include several Christian churches, many fine schools, and a large number of temples. Yokohama is a modern city and owes its importance to a treaty whereby the port of Tokyo was opened to foreign trade in 1859. At that time it was only a small fishing village and the chief business was transacted at Tanawaga, but the latter was soon after abandoned and Yokohama grew rapidly in population and commercial importance. The harbor is now protected by a granite breakwater. In 1923, it was greatly damaged by an earthquake. Yokohama suffered severely from air raids during World War II, the bombing raid led by Gen. James H. Doolittle on Apr. 18, 1942, being considered one of the most devastating. Population, *ca.* 970,000.

Yokosuka (*yō'kô-sŏŏ'kȧ*), a seaport and naval station of Japan, on the western shore of the Bay of Tokyo, 12 m. s. of Yokohama on the Japanese home-island of Honshu. It has a fine harbor on the Bay of Yedo and is connected by railways with the leading cities of the island. Before World War II, the chief industries included shipbuilding, machine shops, brick and pottery works, flour and grist mills. During World War II the area was heavily bombed by the Allies. On Aug. 28, 1945, after the Japanese surrender, U.S. naval units occupied the city. Population, *ca.* 185,000.

Yom Kippur (*yōm kĭp'ŏŏr*). See *Atonement, Day of.*

Yonge (*yŭng*), CHARLOTTE MARY, novelist, born at Otterburn, England, in 1823; died Mar. 24, 1901. She was editor of the *Magazine for the Young* for a number of years and edited the *Monthly Packet* for more than 25 years. Many of her novels were first published in these periodicals; her complete works were issued in about 125 volumes, devoted chiefly to historical and educational themes. The best known of her novels is "Heir of Redclyffe," which is characterized by religious and spiritual sentiment. Other works from her pen are "Life of the Prince Consort," "The Daisy Chain," "The Dove in the Eagle's Nest," and "Life of Hannah More."

Yonkers (*yŏng'kẽrz*), a city in southeastern New York, in Westchester County, on the Hudson River, adjoining New York City on the south. It is served by the New York Central R.R. White Plains Airport is 12 m. E. of the city. Situated on slopes that reach a height of 415 ft., the city covers an area of 21 sq. m. Among its points of interest are the Philipse Manor House, home of the Philipse family, original owners of the land on which Yonkers stands, now a state museum; and Valentine Hill, where Washington's army camped en route to the battle of White Plains. The city is the seat of the Boyce Thompson Inst. of Plant Research, St. Joseph's Sem. and Coll., and the Hudson River Museum. It is also the site of a harness-racing track.



Courtesy Weitner Aerophoto Service, Yonkers, N. Y.

AIR VIEW OF YONKERS CITY HALL

An industrial center, Yonkers has manufactures of elevators, copper wire, refined sugars, pharmaceuticals, aerosol valves, duplicating machines, electronics, and ceramics. It is part of the New York Standard Metropolitan Statistical Area (1960 pop., 10,694,633). In 1958 the city had a value added by manufacture of $139,358,000.

The site of Yonkers was purchased from the Indians and settled in 1639. The community was incorporated as a village in 1855; it was chartered as a city in 1872. It is governed under the city-manager system, established in 1939. In 1900 Yonkers had a population of 47,931; in 1930, 134,646. Its decade of greatest growth was between 1950, when the population was 152,798, and 1960, when it reached 190,634.

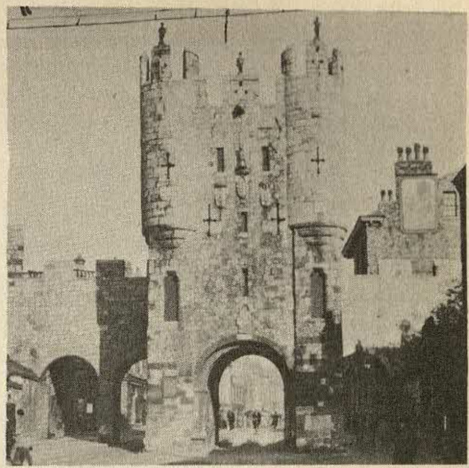
York (*yȯrk*), a river in Virginia, formed by the junction of the Mattaponi and Pamunkey rivers and constituting an estuary 40 m. long and from 1 to 3 m. wide. Eleven miles from its mouth is Yorktown, which was the scene of the surrender of Lord Cornwallis, on Oct. 19, 1871.

York, a city in southeastern Nebraska, seat of York County, *ca.* 50 m. w. of Lincoln. It is served by the Chicago, Burlington & Quincy R.R. York is located in the heart of a rich agricultural region which produces corn, wheat, alfalfa, vegetables, hay, and fruits. Its industries include the manufacture of farm machinery and food products. The city is the seat of York Coll. and of a state penitentiary for women. Founded and laid out in 1869, York was incorporated as a city in 1872. It is governed under the mayor-council system. Population, 1950, 6,178; in 1960, 6,173.

York, a city in southern Pennsylvania, seat of York County, *ca.* 25 m. S.E. of Harrisburg, and served by the Pennsylvania R.R. and the Western Maryland Ry. An industrial and commercial center, York is surrounded by a farming region which produces fruits, grains, truck crops, poultry, and dairy products. The city's manufactures include electrical products, farm and other machinery, paper products, and safes and vaults. It is the seat of York Junior Coll. and the Historical Society of York County. Among its historic buildings are the Friends' Meeting House (1765); St. John's Episcopal Church (1766); and the courthouse where the Continental Congress met from 1777 to 1778, promulgated the Articles of Confederation, and first proclaimed the colonies as the United States of America. York was settled in 1741 and incorporated in 1749. Population, 1960, 54,504.

York, a county town in northern England, capital of Yorkshire, on the Ouse River, 200 m. N.W. of London. It is an important passenger and freight center for the British Railways (North Eastern Region), serving the surrounding fertile farm country.

One of the oldest cities in England, York was of continuous importance from Roman to Stuart times. It was the site of the Roman camp Eboracum and the Roman headquarters for the north; traces of Roman roads and camps are still extant. Street names bear witness to the Danish invasions. Under the Saxons, York flourished as a center of learning from 720 to 800. It was the seat of Parliament under Henry II and of the Council of the North under Henry VIII and was besieged by Parliamentarians in 1644.



MICKLEGATE BAR IN YORK, ENGLAND

Main surviving gateway of the walls which protected the city during the Middle Ages

York has been the seat of an archbishopric since the 7th century. Its cathedral, known as the Minster and built between 1230 and 1500, is one of the most magnificent in England, being particularly famous for its stained glass. Much of the city's medieval character is retained in its narrow streets and old buildings. Noteworthy among the latter are the bishop's palace, the Treasurer's House, and the Merchants' Hall. There also remain about 3 m. of city walls and the ruins of St. Mary's Abbey. Its two well-known schools, St. Peter's and Bootham, were damaged by bombs during World War II, and the old Guildhall and the Church of St. Martin le Grand were destroyed.

The modern city is known for its chocolate factories; other industries are beet-sugar refining, printing, and the manufacture of furniture, glass, and scientific instruments. Population, 1961, 104,468.

York, HOUSE OF, a dynasty of English kings who ruled between the reigns of the Lancaster and Tudor (*qq.v.*) kings. The house of York originated in the ambitions of Richard Plantagenet, 3rd Duke of York (1411-60). He was made protector of the throne when Henry VI (*q.v.*) became insane, and his attempts to assure the succession of his family brought on the Wars of the Roses (see *Roses, Wars of the*). York was defeated and killed at the battle of Wakefield by the forces of Margaret of Anjou (*q.v.*) in 1460. With the aid of Richard Neville, Earl of Warwick (q.v.), York's son, Edward IV (*q.v.*), gained the throne. He was succeeded by his son, Edward V, and his brother, Richard III (*qq.v.*). Except for the period 1470-71, when Henry VI was restored to the throne, the rule of the house of York continued until 1485. The battle of Bosworth Field in that year resulted in the death of Richard III and the accession of Henry Tudor, Earl of Richmond, who united the houses of York and Lancaster by marrying the daughter of Edward IV, and was crowned as Henry VII.

York, ALVIN C., soldier, born in Fentress County, Tennessee, Dec. 13, 1887. Reared on his parents' mountain farm, he enlisted in the U.S. Army in November 1917. He became a sergeant in Company G, 328th Infantry, 82nd Division (the "All-American Division" in which every state in the Union was represented). On Oct. 8, 1918, in the Argonne, he performed what Marshal Foch, the allied supreme commander, called "the greatest thing accomplished by any private soldier of all the armies of Europe." Armed only with a Springfield rifle and an automatic revolver, he killed 20 Germans, took a fortified hill, and captured 132 of the enemy. For this feat he was awarded the Congressional Medal of Honor and the Croix de Guerre. He was presented with a farm in his native state, the money for the purchase of the farm being raised by popular subscription. He has since established on his farm the York Foundation for the education of mountain children. In 1941 Warner Bros. produced a motion picture based on his exploits, entitled "Sergeant York."

Yorkshire (*yôrk'shĭr*), a northeastern county of England, bounded on the north by Durham, west by Westmorland, Lancashire and Cheshire, south by Derbyshire, Nottinghamshire, Lincolnshire, and the River Humber, and east by the North Sea. Its area of 6,089 sq. m. makes it the largest English county. For administrative purposes it is divided into the East, West, and North Ridings. The county town is York (*q.v.*). The largest cities are Sheffield (population, *ca.* 522,000), Leeds (population, *ca.* 497,000), and Bradford (population, *ca.* 287,500). The Humber River, whose tributaries are the Derwent, Ouse, Swale, Ure, Nidd, Aire, and Don, flows into the North Sea and the Ribble flows westward into the Irish Sea.

AGRICULTURE AND INDUSTRY. The East Riding is mainly agricultural, about 87 per cent of the area being under cultivation, with the chief crops sugar beets and cereals. The North and West Ridings are among the principal sheep-farming districts in England. The West Riding is a rich manufacturing district. The sheep-grazing areas have made Yorkshire woolens world famous. Wool cities are Leeds, Bradford, Huddersfield, and Halifax. Coal and iron fields are responsible for the world fame of Sheffield steel products. Middlesborough is the largest pig-iron center in Britain. Coal and commercial clays are also mined. The industrial cities are served by two main railway lines, the London, Midland & Scottish and the London & North Eastern, each with a network of branch lines. Canals and the Humber River connect the cities with seaports. Hull, near the mouth of the Humber, is the largest port on the east coast after London, and also the center of a busy fishing industry. Though thickly populated in the industrial regions, Yorkshire is famous for holiday districts. There are the moors and wolds, upland areas mostly in the North and East Ridings, famous from the books of the Brontë sisters. The east coast has many watering places, among them Scarborough, Whitby, and Robin Hood's Bay. In 1942 the National Trust owned over 1,000 acres in Yorkshire.

HISTORY. The Romans made Eboracum (York) their capital of the north. In 1066 Harold Hardrada was defeated at Stamford Bridge by Harold of England. The county was involved in the continuing strife with Scotland as well as in the Wars of the Roses. In the civil war Cromwell won a great victory at Marston Moor. The county rose in protest at the dissolution of the monasteries and in 1536 joined the Pilgrimage of Grace in great numbers. The county is rich in ecclesiastical architecture; Fountains Abbey is the most complete of the ruined abbeys in England. Leeds and Sheffield have universities, and the educational system of the county provides many scholarships to other universities also. During the war the industrial cities suffered many air raids and the damage was considerable. Among the damaged buildings are the cathedrals of Leeds, Ripon, and Sheffield. Leeds and Hull were the most seriously damaged cities. The county and its boroughs return 57 members to Parliament. Population, *ca.* 4,400,000.

Yorktown (*yôrk'toun*), a town and the county seat of York County, Virginia, on the York River, 11 m. from its mouth and 60 m. S.E. of Richmond. It was laid out as a town in 1705 and at one time had considerable importance as a trading center, but the Revolution and the Civil War left the town in an almost ruined condition.

Yorktown is noted for two famous sieges, one in the Revolution and one in the Civil War. On Oct. 19, 1781, the British troops under Lord Cornwallis surrendered at Yorktown to the Americans under Gen. Washington. The British had possession of Yorktown and defended it with 8,000 men, while the American army under Washington consisted of 9,000 men and the French troops under Lafayette numbered 7,000. This surrender practically ended the Revolution. The second siege of Yorktown took place in 1862, when the Confederates under Gen. Johnson, who commanded an army of 53,000 men, held the city against Gen. McClellan with an army of 120,000 men. Though defeated, the Confederates succeeded in withdrawing their forces. In 1879 a monument was erected at Yorktown to commemorate the surrender of Cornwallis, and in

Courtesy of The New York Historical Society, N. Y.

BATTLE OF YORKTOWN, 1781

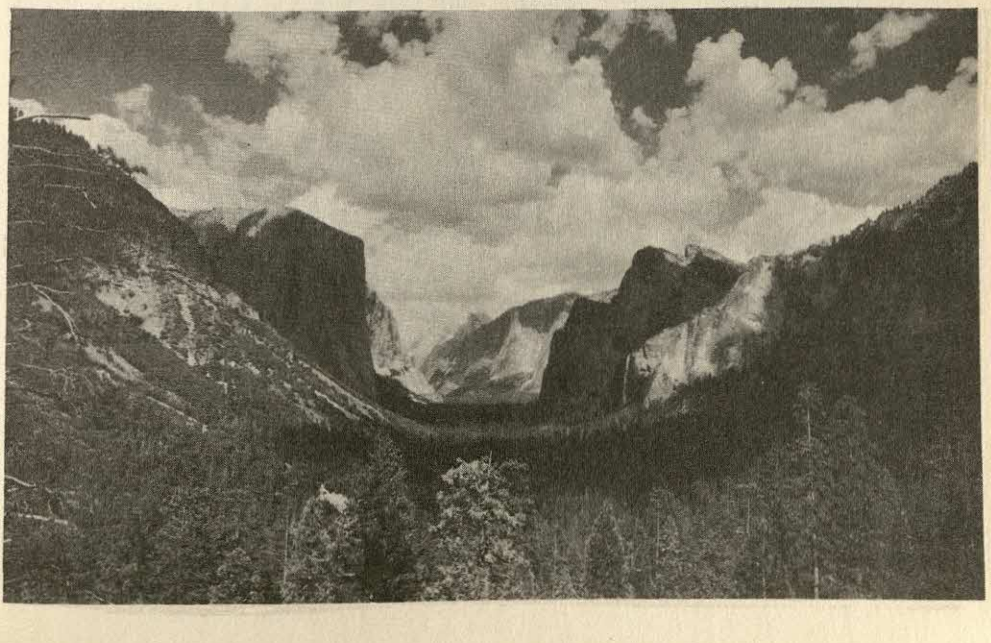
1931 it was the seat of the Yorktown Sesquicentennial. Population, 1950, 384.

York von Wartenburg (*yôrk fôn vär'ten-bo͝ork*), HANS DAVID LUDWIG, soldier, born in Potsdam, Germany, Sept. 26, 1759; died Oct. 4, 1830. He enlisted in the Prussian military service and later entered the army of Holland for service in India (1783-84). He became major general in the Prussian army in 1807 and in 1812 commanded a detachment of Prussian troops against Napoleon in his Russian campaign. After the return of Napoleon from Elba he served prominently in the Prussian army, and was made field marshal in 1821.

Yosemite (*yô-sĕm'ĭ-tê*), a famous and beautiful valley in Mariposa County, California, 150 m.

YOSEMITE NATIONAL PARK

Photo by R. H. Anderson, courtesy Natl. Park Service



S.E. of San Francisco. It rivals the Yellowstone National Park in grand and magnificent scenery and is famed for its purling brooks, bubbling waterfalls, splendid trees, and striking songbirds. The valley is 7 m. long and about a mile wide, but its boundary lines wind in and out among the adjacent mountains. Through the valley flows the Merced River with sheer granite cliffs rising on either side. Among these many perpendicular heights are El Capitan (3,500 ft.), Cathedral Rocks (highest of which is 2,630 ft.), and Half Dome (4,770 ft.). The Upper Yosemite Fall (1,430 ft.), Ribbon Fall (1,612 ft.), Bridal Veil Fall (620 ft.), and Nevada Fall (594 ft.), are among the many waterfalls.

Tourists are attracted to the Yosemite Valley, not only by its grand scenery, but also by its mild and beautiful climate and the great forest trees growing in the valley and in its vicinity. The valley was first discovered by the Mariposa Battalion in 1851. An act of Congress, passed in 1864, transferred the valley to the State of California with the condition that it should always remain a public resort. However, in 1905 California receded it to the U.S. and it is now part of the Yosemite National Park. A large part of the adjacent country is included in the National Forest Reserve, which contains the big trees of Mariposa.

Youmans (*yōō′mạnz*), EDWARD LIVINGSTON, scientist, born in Coeymans, N.Y., June 3, 1821; died in New York City, Jan. 18, 1887. He attended the public schools in Saratoga and afterward studied medicine and chemistry. He established the *Popular Science Monthly,* in 1872, of which he was editor and manager until his death. He and his brother, WILLIAM JAY (1838-1901), who edited *Popular Science Monthly* from 1887 to 1900, are also remembered for introducing Herbert Spencer and Thomas Henry Huxley (*qq.v.*) to the American public.

Young (*yŭng*), BRIGHAM, Mormon leader, born at Whitingham, Vt., June 1, 1801; died in Salt Lake City, Utah, Aug. 29, 1877. He was the son of a farmer, but he learned the trade of a painter and glazier. In 1831 he was converted to Mormonism and soon became an intimate associate of Joseph Smith. He joined the settlement at Kirtland, O., in 1832, was made one of the 12 apostles in 1835, and was chosen president on Dec. 5, 1847, succeeding Joseph Smith in that office. When the Mormons were forcibly expelled from Nauvoo, Ill., he faced the difficulties with great fortitude and led the larger part of the Mormons over the great plains and across the Rocky Mts. to Great Salt Lake, where he founded Salt Lake City in 1847.

By remarkable perseverance and determination the mountain streams were conducted across the valleys and lowlands to irrigate the soil, and the region of Great Salt Lake was converted from a desert waste to a productive and fertile country. In 1849 he organized a state government, which he named the State of Deseret, but the U.S. authorities refused to sanction the new state. Utah was organized as a territory in 1850 and Young served as governor until 1857, when he was succeeded by a Federal appointee. A series of troubles arose, resulting in the government's sending troops to compel obedience to the governor appointed by Federal authority. Young promulgated the so-called celestial law of marriages in 1852, which he claimed had been revealed to Joseph Smith, and accordingly instituted polygamy. The widow and descendants of Joseph Smith have always denied that he was implicated with either the doctrine or the practice of plural marriage. This resulted in a large party leaving the organized church and establishing a branch that repudiated plural marriages. He is said to have had 19 wives and about 56 children. Young was a man of remarkable strength of character, great shrewdness, and undoubted ability. He founded the Mormon temple in Salt Lake City, encouraged agriculture, and developed manufactures.

BRIGHAM YOUNG

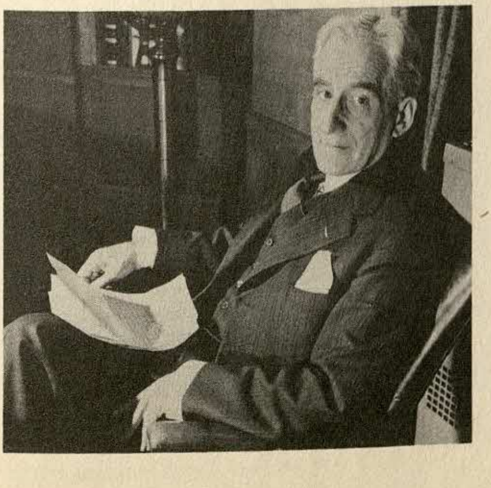
Young, CHARLES AUGUSTUS, astronomer, born at Hanover, N.H., Dec. 15, 1834; died Jan. 4, 1908. He studied at Dartmouth Coll. and became a teacher at Andover, Mass., in 1854. The following year he took up the study of theology at Andover Sem. and in 1856 became professor of mathematics and natural philosophy in Western Reserve Univ., but the following year accepted the professorship of astronomy and natural philosophy at Dartmouth. He accepted the chair of astronomy at the Coll. of New Jersey, now Princeton Univ., in 1877. He made many discoveries in astronomy, including the spectrum of the corona and the presence of sulphur and strontium in the sun. His books include "Elements of Astronomy," "The Sun," and "Uranography."

Young, EDWARD, author and poet, born in Upham, England, in June 1683; died in Welwyn, Hertfordshire, April 5, 1765. He studied at Oxford, took a law fellowship there, and remained in residence until 1730. At that time, having meanwhile taken holy orders, he was made rector of Welwyn. His plays "Busiris" (1719) and "Revenge" (1721) were produced at Drury Lane. He also wrote a series of seven satires under the title "Love of Fame, the Universal Passion" (1725-28). His most notable poem is "The Complaint; or, Night Thoughts on Life, Death, and Immortality" (1742-45).

Young, JOHN RUSSELL, journalist, born in County Tyrone, Ireland, Nov. 20, 1840; died in Washington, D.C., Jan. 17, 1899. Brought to the U.S. in infancy, he was educated in Philadelphia, Pa., and New Orleans, La. In 1857 he went to work for the Philadelphia *Press*. As a correspondent during the Civil War, he turned in a notable report on the Union retreat after the battle of Bull Run, which gained him a newspaper editorship in Philadelphia. After a period (1866-70) with the New York *Tribune,* he was (1872-77) European correspondent of the New York *Herald* and accompanied (1877-79) Gen. Ulysses S. Grant on his trip around the world. From this experience, he wrote "Around the World With General Grant" (2 vols., 1879). He continued to serve in an editorial capacity, but from 1882 to 1885 he served as U.S. minister to China. He proved competent in concluding negotiations of U.S. claims against China and also helped in a Chinese settlement with France concerning Anam and Tonkin (now parts of Viet Nam). In 1897 he was appointed Librarian of Congress. "Men and Memories" (1901) contains his reminiscences.

Young, OWEN D., lawyer and executive, born in Van Hornesville, N.Y., Oct. 27, 1874; died in St. Augustine, Fla. July 11, 1962. Educated at St. Lawrence and Boston universities, Young was an instructor at the Boston Law School (1896-1903) and then practiced law in Boston, Mass. In 1913 he became counsel for the General Electric Co.; he later served as chairman of the board of directors (1922-39, 1942-44). He was instrumental in founding the Radio Corp. of America (1919) and was chairman of its board until 1929. From 1924 to 1934 he was president of St. Lawrence Univ. In 1924 Young was appointed by the Reparations Commission to the committee of experts which formulated the Dawes Plan, placing the payment of German reparations (*q.v.*) on a financial rather than a political basis. In 1929 he supervised a revision of the Dawes Plan which became known as the Young Plan. He was chairman of the Federal Reserve Bank of New York (1938-40) and a member of the New York State Board of Regents (1934-46). Following his retirement (1939) he became an active dairy farmer.

OWEN D. YOUNG



Younghusband (*yŭng′hŭz-bạnd*), SIR FRANCIS (EDWARD), explorer, soldier, and author, born in Murree, India, May 31, 1863; died in Lytchett-Minster, Dorset, England, July 31, 1942. He entered the army in 1882, and in 1886 he made his first exploratory expedition, crossing the Muztagh, the mountain range separating China from Kashmir. In 1902 he was a member of a British expedition sent to Tibet to negotiate a treaty with the Dalai Lama in an effort to counteract Russian influence. He led a mission into the "forbidden" city of Lhasa and concluded the treaty in 1904. He was appointed Bede lecturer at Cambridge in 1905 but resigned the following year to take a post as resident in Kashmir. His many books include "Heart of a Continent" (1896), "Kashmir" (1909), "India and Tibet: Within" (1912), "The Epic of Everest" (1927), "Modern Mystics" (1935), "Everest: the Challenge" (1936), and "The Sum of Things" (1939).

Young Men's Christian Association (*yŭng mĕnz ķrĭs′chạn ạ-sō-sĭ-ā′shŭn*), abbreviated Y.M.C.A., an international group of societies composed chiefly of young Christian men devoted to physical, educational, social, and religious improvement. Founded in London, England, in 1844 by Sir George Williams, and organized in Boston, Mass., and Montreal, Canada, in 1851, the movement spread rapidly, soon gaining worldwide dimensions. Many large "Y" buildings contain gymnasiums and pools which benefit the public; extension and religious classes are also held in these club headquarters. During every war period since the Civil War, the Y.M.C.A. has been active with its service program for the armed forces. The work of the Y.M.C.A., with a staff of trained people, has been carried to every part of the world regardless of race, color, or creed.

In the U.S. there are 1,826 local associations with more than 3,791,000 members and about

379,700 registered nonmembers. Professional Y.M.C.A. workers number approximately 4,000.

In World War II, the Y.M.C.A. was one of the six founding organizations participating in the United Service Organizations, Inc. (U.S.O.) and carried administrative responsibility for roughly one-fourth of the local operations which, at their peak, numbered 3,035; after the war the number went down to about 225. Associations in Canada, England, China, India, and many other countries conducted programs of direct war service to military service personnel and aided substantially in relief and reconstruction service in numerous war-occupied countries. Services among prisoners of war were organized under the World's Alliance of Y.M.C.A.'s, under the Geneva Convention of 1929, the Y.M.C.A.'s of the U.S. alone becoming the channel for more than $12,000,000 (contributed through the National War Fund for this service). As part of their obligation in assisting Y.M.C.A. organizations in other lands in post-war years, the North American associations have also raised a World Youth Fund for Restoration and Reconstruction.

Young Men's *and* **Young Women's Hebrew Associations.** See *National Jewish Welfare Board.*

Young Turks (*yŭng tûrḳs*), a nationalist party aiming at the maintenance of the status of the Ottoman Empire and its reconstitution on democratic principles, founded in 1876. Thereafter the party played a prominent part in Turkish politics and was instrumental in securing the participation of Turkey in World War I on the side of the Central Powers. The war proved disastrous to the Turkish army, and, at its end, the Young Turk party was dissolved.

Young Women's Christian Association (*yŭng wĭm′ĕnz ḳrĭs′chạn ạ-sō-sĭ-ā′shŭn*), abbreviated Y.W.C.A., a world organization dedicated to the moral, spiritual, social, intellectual, and physical welfare of women. The first Y.W.C.A., founded in London in 1855, was the organizational framework for a cooperative Christian movement among women. Today there are Y.W.C.A.'s in 70 countries. The Y.W.C.A. of the U.S., which came into existence in 1858, now has an annual enrollment of 2,000,000 in 440 community associations, more than 500 student Y.W.C.A.'s, and 275 registered Y.W.C.A.'s in rural areas. Following population trends, community associations have extended services to suburban and other areas. Y-Teens, 12- to 17-year-old members numbering *ca.* 350,000 annually, have programs through 6,400 clubs. The Y.W.C.A.'s offer a diversified program of recreation and education, provide housing and food services, and help individuals to solve personal and vocational problems. In the U.S., the Y.W.C.A. is part of the United Service Organizations, Inc. (U.S.O.). In 1946 the U.S. national convention of the Y.W.C.A. adopted an interracial charter, and it endeavors to include in its membership a cross section of persons of different economic, racial, and religious backgrounds. Annually, it helps other national Y.W.C.A.'s through American advisory secretaries, grants of funds, and the training in the U.S. of staff and volunteers from abroad. After World War II, the American Y.W.C.A. raised $2,000,000 for reconstruction of associations overseas. The National Board of the Y.W.C.A. of the U.S. is affiliated with the world organization. National headquarters are in New York City. The national magazine in the U.S. is the *Y.W.C.A. Magazine.*

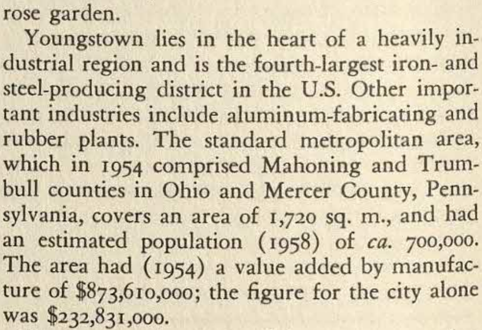
Youngstown (*yŭngz′town*), a city in Ohio, seat of Mahoning County, on the Mahoning River, 67 m. S.E. of Cleveland, Ohio. It is served by the New York Central, Baltimore & Ohio, Pennsylvania, and other railroads. The municipal airport, *ca.* 10 m. to the north, is headquarters for units of the U.S. Air Force. The city is skirted by the Ohio Turnpike, which, at the Pennsylvania state line *ca.* 8 m. to the south, joins the Pennsylvania Turnpike.

The Youngstown park system comprises more than 2,600 acres. Of this total, Mill Creek Park covers some 2,100 acres and includes a noted rose garden.

Youngstown lies in the heart of a heavily industrial region and is the fourth-largest iron- and steel-producing district in the U.S. Other important industries include aluminum-fabricating and rubber plants. The standard metropolitan area, which in 1954 comprised Mahoning and Trumbull counties in Ohio and Mercer County, Pennsylvania, covers an area of 1,720 sq. m., and had an estimated population (1958) of *ca.* 700,000. The area had (1954) a value added by manufacture of $873,610,000; the figure for the city alone was $232,831,000.

Youngstown is governed by a mayor and a seven-member council, all of whom serve two-year terms.

There are more than 60 public and parochial elementary and secondary schools, with an annual



YOUNGSTOWN
Butler Inst. of American Art

enrollment of *ca.* 34,000. Youngstown Univ., established in 1908, has an annual enrollment of *ca.* 5,200. Among the city's cultural institutions are the Butler Inst. of American Art and the Youngstown Symphony. A noteworthy building is the Stambaugh Auditorium.

Founded in 1797 by John Young, and called Young's Town, the community was little more than a frontier village until 1839, when a canal opened the way to Cleveland, Ohio (via the Ohio Canal), and Pittsburgh, Pa. (via the Beaver Canal). The iron and steel industry had its beginnings in 1803 with the establishment of an iron furnace on nearby Yellow Creek. The city was incorporated in 1867 and became the county seat in 1879.

The city's population has grown from 33,220 in 1890 to an estimated 184,883 in 1958. The greatest increase was in the 1910 decade—79,066 to 132,358; in 1950 the population was 168,330.

Ypres (*ē'pr'*), FIRST EARL OF. See *French, John Denton Pinkstone.*

Ypres, town of West Flanders, Belgium, situated on a tributary of the Yser, 35 m. s. of Ostend. Once the capital of Flanders, the city dates back to the Middle Ages, during the 14th century ranking with Bruges and Ghent. The cloth market or Halles located here has a façade over 150 ft. long. Begun in 1201, it was completed a century later, only to be destroyed in the campaigns of World War I fought here. Another victim of the war was the cathedral of St. Martin, a 13th-century edifice with a 15th-century tower. Due to its position near the French border, Ypres has experienced a history of many wars. During World War I the town was the site of three major battles, one of which was highlighted by the introduction of gas warfare. The first battle of Ypres, which lasted from Oct. 19 to Nov. 12, 1914, was one of the hardest of the entire war. The battle was joined when British troops met German troops attempting to reach the North Sea. The British were slowly forced back, until their lines broke on Oct. 31. A counterattack regained all the lost ground, with the actual battle ending on Nov. 12. From then until the second battle of Ypres began on Apr. 22, 1915, trench warfare was maintained between the two forces. In the second battle German forces used, for the first time, gas attacks, inflicting serious damage. When the battle ended on May 25, 1915, 59,250 Allied soldiers had lost their lives. In the second battle, as in the first, little was gained by either side. The third battle of Ypres began on Sept. 20, 1917, and in this battle the Allied forces were completely victorious, ending the battle on Nov. 4, 1917, with the occupation of Passchendaele village. Following the war the town was rebuilt. During World War II, Ypres escaped German heavy damage. Population, *ca.* 17,000.

Ypsilanti (*ĭp-sĭ-lăn'tĭ*), a city in Michigan, in Washtenaw County, on the Huron River, *ca.* 20 m. w. of Detroit. It is served by the New York Central R.R. Willow Run Airport, owned by the U.S. government during World War II but later returned to private operation, is 2 m. E. of the city; adjoining it are the Willow Run aircraft and automobile plants. Ypsilanti's location on the rim of the Detroit metropolitan area has advanced its industrial development. The city's other manufactures include auto parts and accessories, paper and paper products, ladders, tools and dies, aluminum castings, soaps, and plastic products. It is the seat of Eastern Michigan Univ. and Cleary Coll. The site was settled in 1823 and in 1833 was named Ypsilanti for the Greek patriot, Demetrius Ypsilanti (1793-1832). It was incorporated as a city in 1858. Population, 1940, 12,121; in 1950, 18,302.

Yttrium (*ĭt'rĭ-ŭm*), a chemical element (symbol Y) with atomic weight of 88.92 and atomic number of 39. It was discovered by J. Gadolin in 1794 and is a member of the rare-earth series of elements. It occurs in nature in gadolinite, xenotine, and euxenite; it is believed to exist in stars and may be produced by bombarding strontium with 16,000,000-volt deuterons. The element is prepared by electrolyzing its oxide, Y_2O_3, in a solution of fused alkali fluoride. Yttrium is sufficiently reactive to decompose water and acids and forms several ionic compounds which are not hydrolyzed on dissolving in water. The element is used chiefly for the preparation of special alloys. An alloy of chromium, nickel, iron, and yttrium is used in surgery, and an alloy of yttrium and aluminum is used for making pistons which must withstand high temperatures. Alloys with nickel are also heat resistant, and radioactive yttrium has been used as a substitute for radium in radiographing steel.

Yuan (*yü-än'*), a Chinese dynasty of Mongol origin lasting from 1280 to 1368. It was founded by Kublai Khan (*q.v.*) and had 11 rulers. The Mongol dynasty in the north (capital at Karakorum) began with Genghis Khan (*q.v.*) in 1206. He was succeeded by Ogadai, Mangu Khan, and Kublai Khan. In 1280 Kublai Khan became Chinese emperor and proclaimed that Yuan should be the name of his dynasty. The Yuan dynasty was succeeded by the Ming dynasty (*q.v.*).

In 1928, when the Nationalist, or Kuomintang, government was created, the word yuan was used to describe the five divisions of the Chinese government. These divisions were the executive yuan, the legislative yuan, the judicial yuan, the examination yuan, and the control yuan. The word was also frequently used to describe the buildings housing these departments. See also *China; Formosa.*

Yucatán (*yōō-kạ-tän′*), a peninsula of Central America, comprising the Mexican states of Yucatán and Campeche, the Mexican territory of Quintana Roo, all of British Honduras, and the northern part of Guatemala. It is bounded on the N. by the Gulf of Mexico, on the E. by the Caribbean Sea, on the S.E. by the Gulf of Honduras, and on the W. by the Gulf of Campeche. Yucatán is a low, flat region, except for a chain of hills traversing the center of the peninsula. Much of it is dry; the underlying porous limestone absorbs the rainfall, and there are virtually no surface streams. The State of Yucatán (area, 14,868 sq. m.) had a population of *ca.* 598,000 in 1957.

In northern Yucatán there are extensive sisal plantations, which produce most of Mexico's sisal crop. Other products include corn, sugar cane, tobacco, cotton, and coffee. Horses, cattle, sheep, and hogs are raised. In the south are valuable forests of mahogany, rosewood, dyewood, and other lumber trees.

Many of the inhabitants of Yucatán are Indians of the Maya (*q.v.*) group, whose ancestors established an advanced civilization in the region during the 10th century. The high level of their culture is evident in such cities as Chichén Itzá (*q.v.*), Uaxactún, and Uxmal, where the ruins of magnificent pyramids, temples, and palaces have been found. Yucatán was discovered (1517) by Spanish adventurers. It was conquered (1527-47) by followers of Hernando Cortez. It became independent in 1821, passed to Mexico in 1822, and again was an independent state from 1840 to 1843. The principal cities are Mérida, capital of the State of Yucatán, and Campeche, capital of the State of Campeche.

Yucca (*yŭk′ȧ*), a genus of plants of the lily family, having woody stems, lanceolate leaves, and a large pyramidal cluster of whitish, bell-shaped, drooping flowers. Various species have been catalogued, all of which are native to the southern part of the U.S., Mexico, and Central America. Most of the well-known species are cultivated as ornamental plants, especially the kind known as the *common Adam's needle,* which attains a height of 8 to 12 ft. in the native state, but is much smaller when cultivated in gardens. The stem and foliage are employed in Mexico for preparing a fiber useful in making cordage, and the fruit, which resembles a small banana, is consumed as an article of diet.

Yugoslavia (*yōō-gō-släv′ĭ-ȧ*), a federated republic of Central Europe, created Nov. 29, 1945. It is bounded on the N. by Austria, Hungary, and Rumania; on the E. by Rumania and Bulgaria; on the S. by Greece; and on the W. by Albania, the Adriatic Sea, the Free Territory of Trieste, and Italy. The area of the country is 95,558 sq. m.

DESCRIPTION. Much of Yugoslavia is mountainous, with the principal ranges in the north. The Adriatic coast abounds in natural harbors, and there are numerous islands in the Adriatic Sea close to the mainland. The most striking topographic feature of the north is the lofty range of Dinaric Alps running eastward from the Adriatic. The inland region close to the coastal zone lies at a fairly low level and provides extensive farm land. The region between the Alps in the north and the Carpathians in the south is a rich agricultural area. The country is drained principally by the Danube River and its branches, the Morava, Sava, and Drava.

CLIMATE. The coastal region is characterized by mild winters and moderate rainfall. Temperatures inland are much colder than along the coast, which enjoys Mediterranean weather.

MINING. Yugoslavia has considerable mineral resources, largely undeveloped as yet. Minerals include coal, antimony, chrome, copper, lead, gold, and iron. Ranked by volume of production, the most important minerals are brown coal, lignite, copper, lead-zinc ore, and iron ore, in the order given.

AGRICULTURE. The great majority of the country's inhabitants are engaged in agricultural production. In the latest agricultural census, 59 per cent of the land was listed as cultivated. The chief crops are hemp, cereals, wine grapes, and fruits. Cattle and sheep raising and lumbering also are important industries.

COMMERCE. Food, lumber, metal products, chemicals, leather, cement, and paper are among the most important industrial products, and lumber, wood products, and food are produced in large enough quantities to permit exports. However, Yugoslavia's imports (chiefly textiles, iron and steel products, and machinery) exceed the exports by about $125,000,000 annually.

TRANSPORTATION. In 1951 Yugoslavia had 7,212 m. of railway and 30,166 m. of roads. There are 1,316 m. of waterways which are navigable for ships.

GOVERNMENT. Yugoslavia was proclaimed a Federated People's Republic by the constitution adopted on Jan. 31, 1946. There are six constituent republics and two autonomous regions. The former are Serbia, Croatia, Slovenia, Montenegro, Macedonia (South Serbia), and Bosnia-Herzegovina; the autonomous regions are Vojvodina and Kosovo-Metohija. The constitution provided for the breaking up of large estates into small landholdings of not more than 90 acres each. It gave the franchise to women and provided for a separation of the church and the state. The constitution emphasized state planning and socialization and recognized three types of economic enterprise: state ownership (the most important), cooperatives, and private ownership (distinctly circumscribed). The constitution was amended on

Jan. 13, 1953. The new act created the office of president of the republic for Marshal Josip Broz Tito, his election to be the function of the National Assembly. Legislative powers were delegated to a bicameral National Assembly composed of a Federal Council of 359 deputies and a Council of Producers, consisting of one member for every 70,000 working inhabitants belonging to some form of trade union or association. Both councils are elected for four-year terms. The executive organ of state, headed by the president and four vice presidents, is the Federal Executive Council, composed of 37 members from the National Assembly.

EDUCATION. Elementary education is free and compulsory. There were 13,647 elementary schools in 1951-52; in addition there were secondary schools, training colleges for teachers, primary professional and industrial schools, secondary professional schools, agricultural schools, and theological colleges. There are three universities, at Belgrade, Zagreb (Agram), and Ljubljana.

DEFENSE. In 1949 the army consisted of about 350,000 men. An air force and navy are also maintained.

LANGUAGE AND POPULATION. Yugoslavia includes almost all of the Serbs, Croats, and Slovenes, and hundreds of thousands of Magyars, Bulgarians, Albanians, and other smaller minorities. In spite of common cultural background and political unity achieved in 1918, a great deal of cultural, religious, and linguistic diversification still prevails. The Croats and Slovenes are Roman Catholic; the Serbs are mostly Greek Orthodox, while many of them in Bosnia and Herzegovina accepted Islam under Turkish rule. The first speak Croatian and Slovenian respectively and write with Roman characters; the latter speak Serbian and use the Cyrillic alphabet. Racially the peoples of Yugoslavia are representatives of the Dinaric sub-race, but due to early admixture of foreign elements a great variety of other physical types is to be found. For instance, in the provinces bordering on Italy the Mediterranean olive-skinned, black-headed type is frequent; the Montenegrins are among the tallest people in Europe, often approaching 71 in. in height, large-bodied and large-headed; the Serbs have relatively small heads, their stature reaches about 67.2 in., and the body build is of moderate European proportions.

The population of Yugoslavia was estimated in 1941 at 16,261,125, while that of the capital, Belgrade, was estimated at *ca.* 300,000 in 1947. Other major cities are Zagreb, Subotica, Skoplje, and Sarajevo. The principal religions are Serbian-Orthodox, Roman Catholic, Protestant, and Mohammedan.

HISTORY. The history of Yugoslavia is the history of her separate states until 1918. In that year, Alexander I of the Serbian royal house of Karageorge Petrovitch united Serbia and Montenegro with Croatia, Slovenia, Bosnia, and Herzegovina, previously liberated from Austria-Hungary. The kingdom was enlarged and its claims upheld by the Peace Conference of 1919. Until 1929, Yugoslavia was known as the Kingdom of the Serbs, Croats, and Slovenes. In 1921 a constitution embodying the principle of unity was inaugurated. In 1924 Fiume (*q.v.*) was ceded to Italy. Strained relations between the Serbs and the Croats led the king to establish a dictatorship on Jan. 4, 1929, suppress political organizations, and change the name of the country to Yugoslavia. On Sept. 3, 1931, the dictatorship was formalized by a dictated constitution. This dictatorship lasted until Oct. 9, 1934, when Alexander I was assassinated at Marseilles by a Macedonian terrorist. Peter II, born in 1923, succeeded his father under a regency. In 1939 the Croatian nationalists succeeded in gaining internal autonomy for Croatia (*q.v.*). Meanwhile, the regency, which had been leaning toward the Axis powers and failing to gain French military support, was forced by economic ties to sign the Three-Power Pact between Germany, Italy, and Japan on March 25, 1941. For this move, the regency was ousted by a bloodless revolution, whereupon Peter II assumed direct power, and Yugoslavia prepared to defend herself against German forces invading the country on April 6, 1941. The invaders defeated the anti-Axis government and occupied the country, installing a puppet government under Gen. Milan Neditsch. Italy occupied much of Slovenia, the Dalmatian coast, and many of the Adriatic islands, and Croatia was made an independent state under Axis domination in May 1941. Hungary and Bulgaria also joined in the partition of Yugoslavia. Remnants of the Yugoslavian army under Gen. Mikhailovich and an army of patriots under Marshal Tito (*q.v.*) continued to fight the occupying forces. The resisting factions lacked united leadership, however, and were often involved in campaigns among themselves. Marshal Tito soon became the powerful head of a strong resistance movement which was supported by the Allies, and Gen. Mikhailovich lost much of his popularity. Yugoslavia was liberated from German occupation to a large extent in 1944, and Belgrade on Oct. 20. An agreement on Nov. 1, 1944, which was signed by the king's prime minister, Subašsitch, and Tito, abrogated the 1931 constitution and formally recognized the provisional legislative powers of Tito's Anti-Fascist National Liberation Council. Acceding to popular demand, King Peter II, who had reigned in exile from London since April 1941, yielded his power to a regency (Jan. 29, 1945) which in turn installed Marshal Tito as head of a national government. In elections held on Nov. 11, 1945, candidates of the National Front, headed

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SCENES FROM YUGOSLAVIA

A village in the hills of Slovenia (*top*), a windmill in the Banat, Serbia (*center*), and a fishing and resort town on the Istria Peninsula (*above*). The picture at the right shows Marshal Tito signing his consent to his nomination to Yugoslavia's federal diet by a Belgrade electoral district

by Tito, won an overwhelming number of seats in the new parliament. On Nov. 29, the monarchy was abolished and the new assembly proclaimed Yugoslavia a republic and elected Tito as prime minister. By the end of 1945, the new government was generally recognized by other nations, including the U.S. The government became a virtual dictatorship dominated by Communists, supressing all opposition and cruelly persecuting all religious denominations. Yugoslavia's most pressing postwar problems, the rebuilding of the devastated country and the feeding and clothing of a war-weary and impoverished people, was materially aided by the U.N. During 1946 both Yugoslavia and Italy claimed the strategic port of Trieste (*q.v.*), located in what was then the Italian region adjoining Yugoslavia, known as Venezia Giulia. On Feb. 10, 1947, with the signing of the Italian peace treaty, Trieste was taken from Italy, and Venezia Giulia was awarded to Yugoslavia.

Generally regarded as a Soviet satellite, Yugoslavia, in 1948, showed signs of opposition to Russian tutelage; and the country was expelled from the Cominform (see *Communism*) for alleged violation of Communist doctrine. The breach thereafter widened, and Yugoslavia was not invited to join the Council for Economic Mutual Assistance which was set up by Russia to promote economic cooperation among the nations of Eastern Europe. Denied help from the East, Yugoslavia's Communist government sought and received economic aid from the Western nations, stressing, nevertheless, its scrupulous adherence to Marxism. A five-year treaty of friendship with Greece and Turkey was signed in 1953. The vexatious Trieste issue was settled in 1954, Yugoslavia gaining control of areas outside the city itself, plus special rights in the port, which, with the city of Trieste, went to Italy.

Numerous Soviet overtures in 1955 resulted in increasingly cordial relations between Yugoslavia and the U.S.S.R. and its satellite nations.

Yukawa (*yŭ-kä'wä*), HIDEKI, physicist, born in Tokyo, Japan, Jan. 23, 1907. A graduate (1929) of Kyoto Univ., he received a Ph.D. degree (1938) from Osaka Univ., where he also taught (1933-39) as assistant professor of physics, returning to Kyoto (1939) as full professor. In 1935 he announced the existence of the meson (*q.v.*). His theories were later verified by Western physicists, and he was awarded the 1949 Nobel Prize in physics. Yukawa spent a year (1948) at the Inst. for Advanced Studies in Princeton, N.J., and was visiting professor of physics at Columbia Univ. (1949-54).

Yukon (*yōō'kŏn*), a river of North America, the most important waterway of Alaska. It rises in Yukon Territory, near Ft. Selkirk (now Pelly), with two branches, the Pelly and the Lewes, flows toward the northwest to Ft. Yukon, where it receives the Porcupine River, and assumes a general course toward the southwest, flowing into Bering Sea. The Yukon has a total length of 2,125 m., is 20 m. wide in its lower course, and enters the sea by an extensive delta. Great deposits of silt have been made near its mouth, thus preventing the largest vessels from entering from the sea, but it is navigable for almost its entire course. The extreme cold of winter prevents navigation the greater part of the year. Vast numbers of salmon swarm the river in the summer months and ascend fully 1,500 m. from the sea. The chief tributaries of the Yukon include the Koyukuk, Porcupine, Tanana, and Stewart Rivers. It receives the discharge from Lake Teslin through the Hootalingua and the Lewes rivers. The Klondike is a tributary, joining the Yukon at Dawson, and is noted for its gold fields.

Yukon, a territory of Canada, situated in the northwestern part of the dominion. It is bounded on the N. by the Beaufort Sea of the Arctic Ocean, on the E. by Mackenzie District, on the S. by British Columbia, and the W. by Alaska. It extends *ca.* 650 m. from the Arctic Ocean on the north almost to the Pacific Ocean on the south. Its area is 207,076 sq. m.

DESCRIPTION. The surface is elevated and mountainous, and in the interior the altitude ranges from 2,000 to 3,000 ft. In the north, the Richardson Mts. extend along the *ca.* 150-m. Arctic coast line. The Mackenzie and Pelly ranges of the Rocky Mts. cross the central part of the Yukon. In the southwestern corner of the territory are the St. Elias Mts., which include Mt. Logan (19,850 ft.), the highest summit in Canada, and Mt. St. Elias (18,008 ft.). Many of the loftiest mountains rise far above the snow line, both in the north and southwest; many glaciers rise in this area. Valuable forests of vast extent skirt the snowy slopes and the territory's numerous streams.

The drainage is chiefly by the Yukon and its tributaries, the Klondike, Lewes, Pelly, Porcupine, and Stewart rivers. The Yukon has its source in the south and crosses the west central border into Alaska, where it receives the Porcupine River flowing down from northern Yukon. The northwest is drained by the Peel River, which flows into the Mackenzie River system.

The climate is marked by great extremes of temperature, ranging from 68° F. below zero in winter to about 85° F. in summer. The long and cold winters are followed by short but pleasant summers. In the north are masses of ice covered by thick moss; here the ground is always frozen. However, the cold is somewhat mitigated by the dryness of the air. Ice closes the navigation of the Yukon River from the middle of September until the middle of May. Constant darkness prevails during the winter in the northern part, and daylight continues without intermission from the middle of May until the early part of August. The rainfall is not heavy.

RESOURCES. The natural resources of Yukon are extensive. Although lumbering has not been developed extensively, forests of white and black spruce, balsam, poplar, and birch possess some commercial value. Fish and game are abundant and furnish the chief source of sustenance. Among the important animals are the moose, caribou, mountain sheep, bear, elk, deer, and musk ox.

The southern part has a large expanse of cultivable territory. Here the hardier crops, such as rye, barley, potatoes, cabbage, turnips, and peas, may be grown profitably. Many native grasses abound, and grazing and dairying have been developed to some extent. The domesticated animals include cattle, horses, and reindeer.

The Yukon is especially rich in mineral resources, and mining is the chief occupation. Gold, mined in the Klondike region around the central Yukon-Alaska border, is the principal product, although silver, lead, and zinc are also mined in some quantity. Bituminou coal
of a good quality is obtained for local use.

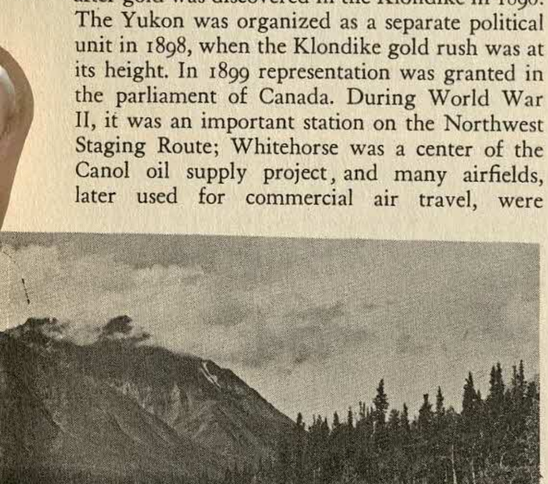
TRANSPORTATION. The Yukon is accessib by
Pacific Coast steamship service from Se ,
Vancouver, and Prince Rupert to Skag
Alaska, and thence by White Pass & Yukon
to Whitehorse, the capital and head of naviga
on the Yukon River system. Access from the p
inces and from Alaska is also provided by
Alaska Highway, constructed in 1942 from D
son Creek, British Columbia, to Fairbanks, Al
of which *ca.* 600 m. cross the Yukon. Air
ice is available from Vancouver, British
lumbia, and Edmonton, Alberta, to Whiteh
where air connection can be made to other p
in the territory and to Alaska. Water tran

tation is available in summer on the Yukon River system. Roads connect the chief mining areas.

Government. The territory is administered by a commissioner (appointed) and a territorial council of five elected members. It is represented in the Canadian house of commons by one member. A public-school system was inaugurated in 1901.

Population. The people who live within the territory consist largely of mine workers and trappers. Substantial business interests have been developed in the towns and the mining districts. Whitehorse, in the south, is the largest town and has been the capital since 1952. Dawson, the center of the Klondike gold fields, is the former capital. Other towns include Selkirk and Mayo Landing. In 1901 the territory had a population of 27,219; in 1931, 4,230; in 1941, 4,914; in 1951, 9,096; and in 1956, 12,190.

History. Although the Yukon-Alaska border had been defined by treaty between Great Britain and Russia in 1825, the interior of the Yukon was unknown until 1840, when Robert Campbell, a representative of the Hudson's Bay Co., explored the region. He followed the Pelly to its confluence with the Lewes, in 1843, and thus discovered the real source of the Yukon River. A large rush of prospectors and gold miners came into the region after gold was discovered in the Klondike in 1896. The Yukon was organized as a separate political unit in 1898, when the Klondike gold rush was at its height. In 1899 representation was granted in the parliament of Canada. During World War II, it was an important station on the Northwest Staging Route; Whitehorse was a center of the Canol oil supply project, and many airfields, later used for commercial air travel, were constructed at that time.



N.F.B. Photo, courtesy Canadian Info. Service, N. Y.

GOLD PROSPECTING IN YUKON TERRITORY

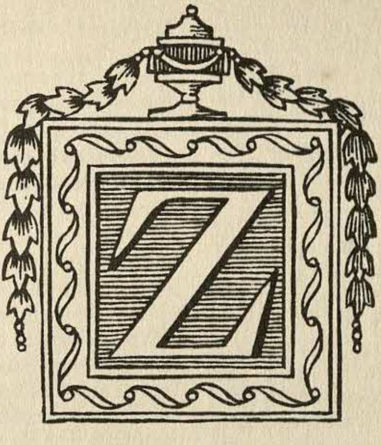
Mining is the chief occupation in the territory, which is rich in gold, silver, and lead

Yuma (*yo͞o'mạ*), a city in Arizona, seat of Yuma County, 20 m. N. of the Mexican border. It is situated at the junction of the Gila and Colorado rivers and is on the Southern Pacific R.R. The surrounding country is agricultural and has fruit-growing and mining interests. Manufactures are primarily food products. First explored by Spaniards in 1539, Yuma did not become a city until 1914. Population, 1950, 9,145.

Yumas (*yo͞o'mȧz*), an Indian tribe of North America, which includes the Mohaves of Arizona. These Indians formerly occupied western Arizona and eastern California, but they are now a small tribe confined principally to the region near the junction of the Gila and Colorado rivers. A government reservation is provided for them at the Fort Yuma Indian Reservation, California, directly opposite Yuma, Ariz. They number about 1,000.

Yünnan (*yo͝on'nän'*), a province in the southwestern part of China. Bordering on Indo-China and Burma on the south, Yünnan covers an area of 162,342 sq. m., most of which is uneven tableland with an altitude of 5,000 to 7,000 ft. The chief mountain ranges run from north to south, reaching a maximum height of 17,000 ft. Through the fertile plains and valleys run some of China's greatest rivers, including the Mekong, the Salween, and the Kinsha (part of the Yangtze system). Although the northern region is barren and thinly populated, the southern and southwestern sections of the province are densely settled and well cultivated. The population consists mainly of Chinese, many of whom are Mohammedans, and aborigines, such as the Lolos, Miaos, and Shans. The chief occupations are farming, mining, metal and stone working. Jade cutting is an important industry, as is other lapidary work. Agricultural products of Yünnan include rice, corn, tea, wheat, sugar, cotton, and vegetables. Rich mineral deposits of anthracite coal, copper, tin, iron, mercury, and gold are worked. The capital of the province is the walled city of Kunming (formerly Yünnan), with about 300,000 inhabitants. Population, *ca.* 9,000,000.

Yverdon (*ē-vâr-dôn'*) or YVERDUN, a city of Switzerland, in the canton of Vaud, at the southwestern end of the Lake of Neuchâtel. Its fine site places it among the noted scenic spots of Switzerland. The palace, built by Duke Conrad of Zähringen in 1135, was the seat of the institute conducted by Johann Heinrich Pestalozzi (*q.v.*) from 1805 until 1825. A museum of Roman antiquities is located here. Relics of walls from the Roman *castrum* still remain south of the town, called Eburodunum by the Romans. Its German name is Iferten. Population, *ca.* 11,000.



Z (*zē*), the 26th and last letter of the English alphabet. It is a sibilant or hissing consonant and has the sound of the hard terminal *s*, as in *dies, stands, multiplies*. In the Phoenician, Greek, and Latin it was the seventh letter, but was dropped from the Latin in the 3rd century B.C. It was restored in the 1st century B.C. to write Greek words, when it was placed at the end of the alphabet. The words in modern English which begin with *z* are all derived from other languages, principally from the Greek. It is the rarest English tone, representing less than 3 per cent of the recognized sounds, and first came into use in 1688.

Zaandam (*zän-däm′*), a city of The Netherlands, in the province of North Holland, 6 m. N.W. of Amsterdam. It is at the junction of the Y and the Zaan Rivers, the latter of which has been canalized. Peter the Great, from Aug. 18 to 24, 1697, occupied a cabin in this place while he worked as a shipbuilder. Much of the surrounding country is marshy grassland. The city looks rather like a large village, because of the many wooden houses, built from the lumber brought to the 200 sawmills, formerly driven by windpower, now mostly by steam and Diesel engines. Only about 10 windmills remain in use. Industries are vegetable-oil mills, biscuits, cocoa butter, paper bags, toys, doors, flooring, and ammunition, manufactured at the nearby state arms factories. Population, *ca.* 40,000.

Zacatecas (*sä-ḳä-tä′ḳäs*), a city of Mexico, capital of the state of Zacatecas, 300 m. N.W. of the city of Mexico. It has railway connections and is surrounded by one of the most productive mining regions in the world. The rich silver veins in the vicinity were discovered in 1546. The city grew in importance with the development of its mineral resources. It enjoys a considerable trade in farm produce and merchandise. Population, *ca.* 25,000.

Zachary (*zăḳ′ȧ-rĭ*), or ZACHARIAS, in the New Testament, the father of St. John the Baptist (St. Luke 1:5).

Zadok (*zā′dŏḳ*), Hebrew meaning "righteous," in the Old Testament, the name of a high priest who lived at the time of Solomon. He was the ancestor of generations of high priests until this office was abolished under Antiochus Eupator, in the middle of the 2nd century B.C.

Zagreb (*zä′grĕb*), or AGRAM, the second largest city of Yugoslavia, capital of Croatia-Slavonia. It is situated on the Sava River, surrounded by mountains. A financial center, it produces tobacco, leather, linen, carpets, hats, boots, paper, chemicals, varnish, and oil-colors. A settlement existed here in Roman times, but the first written record dates from 1093 when the city was made an episcopal see. In 1242, it was sacked by the Tartars, who were later expelled. In that same year, Zagreb became a royal free city, and in 1867, it was made the capital of Croatia-Slavonia. It became the center of the Yugoslav nationalist movement in 1918. In 1939, it was made the capital of the autonomous province of Croatia-Slavonia, set up within Yugoslavia, and remained the capital when the independent kingdom of Croatia was set up in 1941. Population, *ca.* 185,000.

Zagros Mountains (*zä′grōs moun′tĭnz*), a range of mountains separating Iraq from Iran, and running through southwest and southern Iran. The mountains are formed of thick Cretaceous and Tertiary series and some Paleozoic rocks. They contain an abundance of various types of limestone. The Zagros Range and its extensions run about parallel to the river Tigris.

Zalinski (*zȧ-lĭn'skē*), EDMOND LOUIS GRAY, soldier, born in Kurnick, Germany, Dec. 13, 1849; died Mar. 10, 1909. He came to the U.S. in 1853, was graduated from the schools of Syracuse, N.Y., in 1863, and entered the Union Army. In 1864 he was placed on the staff of Gen. Miles and for bravery at the Battle of Hatcher's Run, Virginia, was commissioned second lieutenant. He remained on Gen. Miles's staff until the close of the war. In 1866, he was made second lieutenant in the regular army and was promoted to captain in 1887. He taught military science at the Massachusetts Institute of Technology from 1872-76. He invented an electrical fuse for the pneumatic dynamite gun. He also invented a telescopic artillery sight, an intrenching tool, and a ramrod bayonet.

Zambezi (*zȧm-bē'zē*), a large river of South Africa, which ranks as the fourth in size of that continent. It rises near the southern boundary of the Congo Free State and, after a tortuous course of 1,650 m. toward the southeast, flows into the Mozambique Channel by an extensive delta. The upper course is generally toward the south, while the middle portion flows toward the northeast, and the lower course is toward the southeast. A short distance above Sesheke, at the eastern extremity of South-West Africa, is the Katema Molilo Rapids, and some distance below it is the celebrated Victoria Falls. This falls is 400 ft. high and about 2,500 ft. above sea level. The Zambezi basin includes 750,000 sq. m., much of which is highly fertile and contains valuable forests. The Zambezi delta has an area of 25,000 sq. m. The river's chief confluent is the Shire River, which rises in Lake Nyassa and joins the Zambezi 90 m. above the sea. The Zambezi system furnishes about 4,000 m. of navigation, but as a whole it is comparatively unimportant for commercial purposes, since the stream and many of the tributaries are obstructed by falls and rapids. See also *Victoria Falls.*

Zambo (*zăm'bō*), or SAMBO, a half-breed, one of mixed Negro and Indian blood, especially in Honduras and other sections of Central America.

Zamora (*thä-mō'rä*), DON NICETO ALCALA, president of the Spanish Republic (1931-36), born in Andalusia, July 6, 1877; died in Buenos Aires, Feb. 18, 1949. He attained prominence through the practice of law and the publication of authoritative works on jurisprudence and allied subjects. His main activities, however, lay in the field of politics. Starting as a member of Parliament in 1906, under the monarchy, and holding various positions thereafter, he became minister of public works in 1918, minister of war in 1923. His Republican sympathies resulted in his imprisonment in 1930. In 1931 the existing government was overthrown largely through the efforts of Zamora's followers and Zamora became the first president of the newly established republic of Spain. He resigned this post, Oct. 14, 1931, expressing opposition to the anti-church policy of the National Assembly. In December, however, he again accepted the position, retaining it until April 1936, when the parliament voted him out of office. When Generalissimo Franco (*q.v.*) came into power in 1941 he sentenced Zamora to a 15-year exile.

Zanesville (*zānz'vĭl*), county seat of Muskingum County, Ohio, 52 m. E. of Columbus. It is served by the Baltimore & Ohio, the Wheeling & Lake Erie, the Pennsylvania, and the New York Central R.R.'s. The city is situated at the confluence of the Licking and Muskingum rivers and is surrounded by a fertile agricultural region. From 1810 to 1812 Zanesville served as the state capital. The city was the birthplace of author Zane Grey (*q.v.*), who mentions the place quite frequently in his books. Zanesville's trade is primarily in agricultural produce, merchandise, and bituminous coal, which is mined in large quantities in the vicinity. It has large foundries and railroad machine shops. The manufactured products include glass, machinery, floor and wall tile, art pottery, batteries, transformers, radiators, farm machinery and sheet metal. One of the first settlements in the Northwest Territory was made at Zanesville, in 1799, by Ebenezer Zane, and it was incorporated as a town in 1814 and as a city in 1850. Population, 1950, 40,517.

Zangwill (*zăng'wĭl*), ISRAEL, novelist, born in London, England, Feb. 14, 1864; died Aug. 1, 1926. He was educated at the Jews' Free School in London, where he later taught, and at London Univ. He was founder and editor of *Ariel, the London Puck*, but he first won fame in 1892

ISRAEL ZANGWILL

with his novel of Jewish life, "Children of the Ghetto," which was produced as a play in New York in 1899. His other novels and later his plays also dealt largely with the life and problems of the Jews and with other economic and political issues, but he won his greatest success with a light comedy, "Merely Mary Ann." His novels include "They That Walk in Darkness" and "The Mantle of Elijah"; his plays include: "The War God," "The Next Religion," and "The Melting Pot" (1908), which proposes amalgamation as the solution of the Jewish problem in America. He was a pioneer of the Zionist movement.

Zante (*zän'tē*), one of the largest islands of the Ionian group, situated 9 m. w. of the Peloponnesus. It has an area of 277 sq. m. The island is of volcanic origin, but has fertile soil. The climate is pleasant and healthful. Oranges, olives, melons, citrons, and currants are the chief products. It has manufactures of wine, carpets, cotton and linen goods, gold ornaments, and clothing. The wine and currants of Zante are widely known. Formerly the island was known as Bacynthus and was long an independent state. In 1864, it was annexed to Greece along with the Ionian isles. Zante is the capital and largest city. Population, *ca.* 45,000.

Zanzibar (*zăn-zĭ-bär'*), a sultanate and British protectorate in East Africa. It includes the islands of Zanzibar and Pemba off the eastern shore, some nearby islets, and a strip of coast on the mainland 10 m. deep. This mainland territory is known as the Kenya Protectorate and is administered with Kenya Colony. Extreme heat and moisture make the climate unsuitable for most Europeans. The island of Zanzibar has an area of 640 sq. m. It contains the city of Zanzibar, which is the chief town and seat of local government, and has an estimated population of 50,000, thus being one of the largest cities on the eastern coast of Africa. Pemba has an area of 380 sq. m. Both these islands have fertile soil and good harbors. They produce 80 per cent of the world's cloves. Other products include hides, ivory, copra, shells, cotton, indigo, rice, fruits, and vegetables. Domestic animals, such as cattle and horses, are reared successfully. Before the war the rest of the British Empire enjoyed about half the export and about one-third of the import trade. Steamship communications are maintained with other ports of East Africa, and there are good roads throughout both islands. Most of the people are Mohammedans, but many Christian missions are maintained. Slavery in a modified form existed until 1907 though the legal status of slavery was actually abolished in 1897. The sultan of the British protectorate of Zanzibar heads an executive council. The British administrator or resident also presides over this body as well as over the legislative council. In the courts of the sultan, Mohammedan law is administered for both Arabs and natives, while British law courts are maintained for British and foreign subjects and others. Population, *ca.* 250,000, of whom 278 are Europeans; 14,000 British Indian; 33,400 Arabs. The natives include Watumbatu, Wahadimu, Wapemda, and Waswahili.

Zaporozhie (*zȧ-pô-rôzh'yĕ*), formerly Alexandrovsk, a city on the left bank of the Dnieper River, in the Ukrainian Soviet Socialist Republic. Nearby are the Dnieper Rapids and the Dniepropetrovsk hydraulic power station. Zaporozhie is a junction for several Russian railways and is a center for the manufacture of motors and farm machinery. Population, *ca.* 290,000.

Zara (*zä'rȧ*), a seaport located in Dalmatia, on the east coast of the Adriatic Sea, 130 m. s.e. of Trieste. In 1924, it was annexed by Italy along with Fiume and other former Austrian possessions, but was included in Yugoslav territory after World War II. The seat of a Roman Catholic archbishop as well as of a Greek Orthodox metropolitan, Zara is a busy trading and fishing port. It also has several industries, including flour and glass manufacturing. Population, *ca.* 18,600.

Zarathustra (*zär-ā-thŏŏs'trȧ*), a figure created by the German philosopher Friedrich Nietzsche (*q.v.*). It is the bearer of Nietzsche's message and philosophical ideas in his book, "Also sprach Zarathustra" ("Thus Spoke Zarathustra"). The name is obviously derived from the Persian Zoroaster (*q.v.*), the founder of the religion of Zoroastrianism. The philosophy of Nietzsche's Zarathustra, however, has nothing to do with the philosophy of Zoroastrianism (*q.v.*).

Zealand or ZEELAND (*zē'lạnd*), the largest island of Denmark. It is separated from Sweden by The Sound and from the island of Fyen by the Great Belt. The shores are indented by numerous inlets, thus reducing the land area to 2,638 sq. m. Farming and dairying are the chief industries, but it has considerable interests in stock-raising, fishing, and manufacturing. The chief manufactures include woolen and linen goods, leather, dairy products, salt, clothing, machinery, and sailing vessels. Copenhagen is the capital of Zealand and of Denmark. Other important cities include Roeskilde, Elsinore, and Slagelse. Population, including the islets of Amager and Möen, *ca.* 1,253,700.

Zebra (*zē'brȧ*), an animal resembling the horse, but having external characteristics found in the ass. It resembles the latter in having no warts on the legs, in the tail being covered with long hairs only toward the extremity, and in the full and arched neck having an erect and stiff mane. Several species have been described, all of which are more or less striped. The height is about 4½ ft. at the shoulder and the form is light and graceful. The general color is a yellow-

New York Zoological Society Photo

MOUNTAIN ZEBRA AND COLT

ish white, with black stripes on the neck, limbs, and body. Zebras have ears rather longer than those of the horse and the senses of hearing, smell, and sight are well developed. They are shy animals and on the least alarm gallop off to a place of safety. When attacked by an enemy, they defend themselves by forming a compact body and beating with their heels. In this way they are able to protect themselves successfully against the leopard and lion. Zebras were formerly found throughout the region of Africa lying south of the Equator, but their number is diminishing quite rapidly. The *true zebra,* or *mountain zebra,* of the mountainous parts of Cape Colony has been nearly exterminated. It is more barred than *Burchell's zebra,* found in herds on the plains of South Africa. Other species inhabit the country south of Abyssinia and Somaliland. The natives prize the flesh of the zebra and use these animals as beasts of burden in the domesticated state.

Zebu (*zē'bū*), a class of animals of the ox family, which are reared extensively in the region from Japan to East Africa, but they attain the greatest perfection in India. Many species have been originated by breeding, varying much in size, strength, and color. Zebus are docile and gentle animals. In general they are reared for their milk and flesh, but are used quite extensively as beasts of burden and draft. They are able to travel 25 to 30 m. per day with a reasonable burden. The larger breeds, when yoked to the wagon or plow, serve every purpose of the strongest ox. The zebu is as important in India, Persia, Arabia, and other Asiatic countries, in the industries and household economy, as cattle are in America and European countries.

Zebú (*sā-bōō'*). See *Cebu; Philippines.*

Zebulun (*zĕb'ū-lŭn*), one of the 12 tribes of Israel, whose country lay in the fertile valleys and hills north of the plain of Jezreel, extending from the Lake of Gennesaret to the Mediterranean. We learn from Genesis 30:20 that the Zebulunites descended from the sixth son of Jacob and Leah. They were noted for their skill in commercial enterprises and their warlike spirit. In their prosperous times they had a profitable trade from their ports on the Mediterranean with the Phoenicians.

Zechariah (*zĕk-à-rī'à*), or ZACHARIAH, a prophet of the ancient Hebrews, son of Berechiah, the son of Iddo. He was born in Babylon at the time of the captivity and accompanied the exiles led by Joshua and Zerubbabel to Palestine, where he developed much influence among his countrymen and was elevated to the offices of priest and prophet. His name is attached to the 11th in order of the 12 minor prophetic books, and his prophecies are devoted largely to the glory that shall come to Jerusalem after the rebuilding of the temple. The book assigned to him is the largest of those written by the minor prophets. Together with the Book of Haggai, it was the first prophetic book written after the return of the Jews from Babylon to Jerusalem in 520 B.C. The immediate reason for the addresses of Zechariah was the disappointment of the Jews with the newly installed community. Crop failures and political unrest between the Jews and the surrounding peoples almost decided them to go back to Babylon. Haggai, and still more strongly his successor, Zechariah, preached against this return.

Zechariah predicted that both Phoenicia and Damascus would be brought to ruin, but pictured a brighter future for Judah than would fall to the share of Javan (Greece). According to his prophecies, the Hebrew people were to pass through a time that would test their courage and perseverance, but, when the good times returned, a period of great prosperity would follow, and "every pot in Jerusalem and in Judah shall be holiness unto the Lord of hosts."

Throughout the whole book runs a strong Jewish nationalism and the firm belief that finally all people in the world will embrace the Jewish faith. Zechariah combined this Jewish nationalist idea with prophecies of coming political developments and general exhortations for a purer and more ethical life.

Zedekiah (*zĕd-ė-kī'à*), the son of Josiah by his wife, Hamutal, and the last king of Judah. He succeeded his nephew, Jehoiachin. The Chaldeans captured him at the siege of Jerusalem, in 586 B.C., and conveyed him to Babylon, after blinding him and slaying his sons. He died in captivity and with him the kingdom of David and Solomon ended.

Zeebrugge (*zā'brōōg-ę*), a seaport of Belgium, situated in the province of West Flanders, 7 m. w. of Bruges, which it serves as a port. A ship canal 9 m. long was opened between the two towns in 1907. During World War I, Zeebrugge and its canal were used by Germany as a launching base for submarines. On Apr. 23-24, 1918, a British naval expedition under Adm.

Roger Keys succeeded in blocking the canal, but the Germans afterward cleared it and continued to use it. Zeebrugge was heavily bombed in World War II during the German occupation, the coke ovens being a continued target for Allied airmen.

Zeeland (*zē′lạnd*), a province of The Netherlands situated in the southwestern corner of that country, bounded by the provinces of South Holland and North Brabant, and by Belgium. Its area is 689.5 sq. m., and the capital is Middelburg. The entire province has been formed out of numerous small islands, which gradually were joined. The largest part lies below sea level and is artificially drained.

The population is predominantly of the Frankish type, but since the Middle Ages has been mixed with brachycephalic peoples, with dark hair and dark eyes. On Dec. 31, 1930, 48% was Netherlands Reformed, 11% Reformed, 25% Catholic, 0.08% Jews, 9% of other denominations, and 6% without church affiliation. Local costumes persist on the various islands to a larger degree than elsewhere in The Netherlands.. The municipalities with the largest populations on Jan. 1, 1947, were: Middelburg, 20,573; Vlissingen, 16,154; Goes, 13,134; and Terneuzen, 12,640. The population of the province in 1946 was 257,577.

Agricultural pursuits predominate. About 73% of the soil is cultivated, 23% is grassland, and 4% is used in horticulture. Sugar beets, flax, and caraway and other seeds are important. The most important industries are machine shops, grain mills, shipbuilding, glass, metal, and chemical factories, knitting mills, and wooden shoe factories. Important also are the fisheries.

The most important communications are: the railway from Bergenop-Zoom, over Goes and Middelburg to Vlissingen, where steamboats connect with Harwich (England); the railway from Terneuzen over Ghent to Malines (Belgium); the short railway from Goes to Hoedekenskerke; steam tramways and bus lines connect the various smaller towns; regular provincial steamboat services ply between the islands.

Middelburg and the harbor of Vlissingen suffered severely from military action in the last war. Walcheren and Schouwen-Duiveland were inundated with salt water and reconstruction will take years.

Zeeman (*zā′män*), PIETER, physicist, born in Zonnemaire, Holland, May 25, 1865; died Oct. 13, 1943. Zeeman's research centered on the relation between magnetism and light. In 1896 he discovered the effect of a magnetic field on spectral lines, a discovery that has led to greater knowledge of the spectrum.

Zeeman received the Nobel Prize for physics in 1902 with his teacher, Hendrick Lorentz, for research on the influence of magnetism on phenomena of radiation.

Zeisberger (*zīs′bĕrg-ẽr*), DAVID, missionary, born in Zauchtenthal, Austria, Apr. 11, 1721; died in Goshen, O., Nov. 17, 1808. He was descended from German-Moravian parents and in 1740 came to America, settling in Georgia. Later he moved to Bethlehem, Pa., where he took part in establishing the Moravian colony and studied the Indian languages. In 1743, he took up missionary work among the Delawares and Onondagas, converting many of them to Christianity. His missionary work was interrupted by the French and Indian War, but he continued active as a religious worker, and, in 1771, established a mission on the Muskingum River, Ohio. This settlement was broken up by the Wyandots and he went to Canada, but returned to Ohio in 1798 and founded Goshen. Zeisberger was master of several Indian languages and wrote many valuable works, including Indian-English grammars, spelling books, and dictionaries.

Zeller (*tsĕl′ẽr*), EDUARD, theologian and philosopher, born in Kleinbottwar, Germany, Jan. 22, 1814; died Mar. 19, 1908. He studied at Tübingen and Berlin and became a teacher of theology at the former university in 1840. In 1847, he accepted the chair of theology at the Univ. of Bern and later taught at Marburg, Heidelberg, and Berlin. He was one of the founders of the *Theologische Jahrbücher*, in which he published much in support of the philosophical and historical methods of Strauss and Hegel. His writings include "Philosophy of the Greeks," "The Theological System of Zwingli," "The State and the Church," and "The History of Philosophy Since Leibnitz."

Zemstvo (*zĕmst′vô*), a former elective assembly in the government of a province in Russia. This form of district government was established by Alexander II in 1864. It was presided over by the president, or head, of the province and held general administrative power within its jurisdiction. See also *Russia; U.S.S.R.*

Zenana (*zē-nä′nȧ*), the name of a dwelling used by a high-caste family of India, in which the women and girls have their quarters. A typical dwelling of this kind is in two parts, each built around its own court, and the one nearest the street is occupied by the men. The zenana is in the rear building, usually on the second floor, while the first floor is occupied by the kitchen and in part is used for storage. The poorer buildings of this class are so constructed that cows and other domestic animals occupy a part of the first floor.

Zend-Avesta (*zĕnd-ȧ-vĕs′tȧ*), the holy book of the Parsees (*q.v.*), written in the Zend language. This language is related to Sanskrit (*q.v.*) and to the ancient Persian language as it was spoken at the time of the Achaemenaeans (559-330 B.C.). Zend was obviously even at this time a dead language, used only for holy scriptures in the same way as the Roman Catholic Church uses Latin. Some scholars even believe that Zend was never an independent language. In any case, the Zend-Avesta has been translated in Pahlavi or Pehlavi.

Allegedly the original Avesta was destroyed by Alexander the Great (356-323 B.C.) when he invaded Persia. In any case, only some of its parts are preserved and were edited in 21 volumes in the 3rd century A.D. The larger Avesta, which is believed to have existed before Alexander, probably consisted of 21 books or "Nasks." It is, of course, impossible today to distinguish clearly between the ancient remnants and probable additions of the 3rd century. We know, however, that the point of origin was Persia, especially its eastern part.

The Zend-Avesta is a collection of writings, perhaps edited but surely not written by one man, although the ancient Greeks, as well as later Arabian historians, believed that Zoroaster was the author (see *Zoroastrianism*) The first part, the "Yesna," is a kind of liturgical book still used by the Parsees. It contains the Gathas or hymns of Zoroaster, the only part which modern scholars attribute directly to the authorship of Zoroaster. The story of the creation, contained in the third part, the Vendidad, is essentially the story of the fight between the good and the evil, between Ormazd (*q.v.*) and Ahriman, in connection with the story of the life of Zoroaster. The other three parts of the Zend-Avesta are of minor importance.

Modern scholars owe much of their knowledge of the Zend-Avesta to the work of Anquetil Duperron, who in the middle of the 18th century lived in India and knew Parsee priests. It was he who aroused European interest and scholarship in it.

Zenger (*zĕng′gĕr*), JOHN PETER, publisher, born in Germany, in 1680; died in 1746. He emigrated to America in 1700 and established himself in the printing and publishing business in New York City. In 1733 he founded the New York *Weekly Journal,* which he made an important factor in the government. His attacks upon some of the practices of public officials caused him to be arrested on a charge of libel. Andrew Hamilton, an eminent barrister from Philadelphia, was employed to defend him before the jury, and a verdict of not guilty was the result. This trial established a precedent in furthering the freedom of the press in America.

Zenith (*zē′nĭth*), in astronomy, the point in the heavens which is precisely over the head of the observer. The point directly opposite under the feet of the observer is called the *nadir.* A plumb line suspended from the zenith would pierce space so as to rest upon or directly above the nadir.

Zeno (*zē′nō*), Greek philosopher, founder of the Stoics, born at Citium in Cyprus about 350 B.C.; died about 258 B.C. He should not be confused with Zeno the Eleatic, another Greek philosopher who lived *ca.* 500 B.C. The latter Zeno was a disciple of Parmenides (*q.v.*) and became the teacher of Pericles.

Zeno the Stoic was the son of a merchant and, after losing his fortune in a shipwreck, adopted the Cynic doctrines, a form of belief that holds riches in contempt. To fit himself for teaching, he studied 20 years under various masters and then established a school and developed a system of philosophy. He taught his system in the Stoa and therefore his followers became known as Stoics (*q.v.*). Zeno was a contemporary of Epicurus, the founder of the Epicureans. The doctrines taught by him inculcated simplicity and energy, led the student to a life of patience and fortitude, and developed nobility of character. He preferred wisdom to knowledge, which he considered to be only a presupposition of wisdom but not a final goal in itself. He believed that nature in itself is sensible, a creation of a reasonable world-soul. Therefore, the prescription for moral action, ethics, follows from the recognized knowledge of nature. Our actions must be virtuous because our conscience is based on our knowing that we fulfill our duties, a logical conclusion since we are a part of nature and know how nature works sensibly.

Many ancients embraced the doctrines taught by Zeno, and both Greeks and Romans honored him in paintings and sculptures. Only a few fragments of his writings are extant.

Zeno, Emperor of the Eastern Empire from 474 to 491, the husband of Ariadne, daughter of Leo I. In 468 he became patrician commander of the imperial guard and of the armies of the East. His reign was largely disturbed by wars, both by the invading Goths and by the people of Constantinople, who opposed him because he was of foreign birth. His government was cruel and oppressive and he gave himself up to pleasure, leaving the administration of public affairs to Illus, his sole consul and minister. He was succeeded by Anastasius.

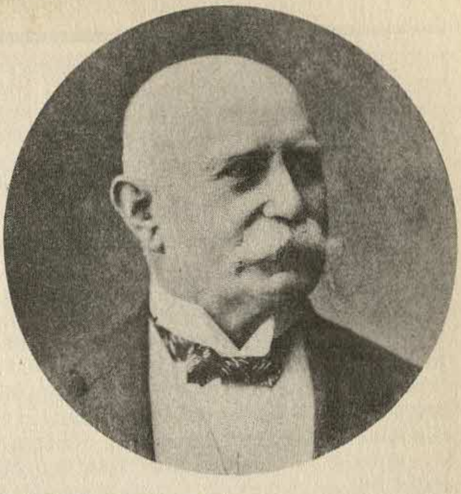
Zenobia (*zē-nō′bĭ-ȧ*), SEPTIMIA, Queen of Palmyra and wife of King Odenathus. She was the daughter of an Arab chief and was noted for her learning in Greek, Latin, Syriac, Egyptian, and other languages. After the death of her first husband she married Odenathus, Prince of Palmyra, who was highly successful in the Persian wars. She was courageous and learned, and accompanied her husband to the East as an adviser and assistant. After the death of her husband, in 266 A.D., she succeeded to the throne, assuming the title of Queen of the East. It was her ambition to annex Asia Minor, Syria, and Egypt, but the Romans under Emperor Aurelian defeated her in two battles in 270 and besieged her at Palmyra. After a brave defense, she attempted to escape from the city, but was taken captive and carried to Rome, where she was made to grace the triumph of Aurelian. The latter presented her with large possessions near Tivoli, where she lived in comfort and luxury until her death. Her son, Vahballathus, by her first husband was given a principality in Armenia.

Zeolites (*zē′ō-līts*), hydrous aluminum silicates usually resulting from the decomposition of more complex silicates. The zeolite minerals are commonly found in igneous rocks and in most soils, and have the property of holding potassium and ammonium salts from being washed rapidly out of the soil. However, they release these salts to plant roots easily.

Zeolites are insoluble in water but react with alkali and alkali-earth metals. When a sodium zeolite is treated with a solution containing calcium or magnesium, all of the alkali-earth metals (calcium or magnesium) are absorbed by the zeolite and sodium is exchanged for them in equivalent amounts. This property was utilized commercially for water treatment of boiler feeds.

Zephaniah (*zĕf-ȧ-nī′ȧ*), the ninth in order of the 12 minor Hebrew prophets, who prophesied in the reign of King Josiah, from 630 to 624 B.C. According to the account, he descended in the fourth generation from a man by the name of Hezekiah, which is supposed to have reference to the King of Judah. His prophecy is divided into three chapters. The first is a warning against Judah and the Philistines; in the second he foretells the fall of Nineveh; and in the last he predicts salvation and a blissful future for those who are purified in the fear of God.

Zeppelin (*tsĕp-ẹ-lēn′*), FERDINAND, COUNT VON, soldier and aeronaut, born in Constance, Germany, July 8, 1838; died Mar. 8, 1917. He studied at the Polytechnic School in Stuttgart and in a military school at Ludwigsburg. In 1858 he became an officer in the army. He took part in the Seven Weeks' War and the Franco-Prussian War. Subsequently he began to study airships with a view of producing devices which would be of military value. He established a works at Friedrichshafen, on Lake Constance, where he produced dirigible (*q.v.*) balloons. He was the first to employ engines of considerable power to propel them. In 1908, he made a memorable flight of about 800 m. with a maximum speed of 40 m. per hour, but his airship was wrecked by a storm after the successful experiment. A popular subscription was immediately taken to rebuild this airship. Von Zeppelin was one of the German military observers attached to the Army of the Potomac during the Civil War (1863). See also *Balloon; Eckener, Hugo.*



COUNT VON ZEPPELIN

Zero (*zēr′ō*), from Arabic *sifr* meaning "empty" or "cipher," a number used to represent nothing or none. The introduction of the number zero is generally credited to the Hindus of the 9th century A.D., although some of the uses of zero antedate this period. Zero is used in several ways. For example, 0 is used to represent the result of such an operation as $2 - 2$. It is used to fill in a blank space in a number expressed in positional notation as 3012 which expresses three thousand and twelve as three thousand, zero hundreds, and twelve. It is also used as a starting point in scales, such as for temperature.

The number zero is used in computation just as any other number is used with the very important exception that it must never be used as a divisor (see *Division*). A common illustration of the effect that would be produced if division by zero were a permissible operation is the following:

Let $a = b$; then $a^2 = ab$; and $a^2 - b^2 = ab - b^2$; whence $(a - b)\ (a + b) = (a - b)b$.

Now, dividing each side by $a - b$ (which is equal to 0), we have $a + b = b$. Since $a = b$, this becomes: $2b = b$, and thus $2 = 1$.

In chemistry and physics, zero indicates a point in time or space used *arbitrarily* as a reference for measurement. Thus zero on the Fahrenheit, Centigrade, or Réaumur temperature scales does not mean a lack of heat, but simply a point of reference from which to start measuring the intensity of heat, and temperature may have plus or minus degrees depending upon whether the temperature is greater or less than the arbitrary point, *0*. These scales are not satisfactory for mathematical operations since division by zero is not permissible. For such purposes the absolute or Kelvin scale is used, on which the value 0 indicates a complete lack of heat and is in reality the temperature at which the volume of an ideal gas would theoretically vanish. Thus there are no negative absolute temperatures.

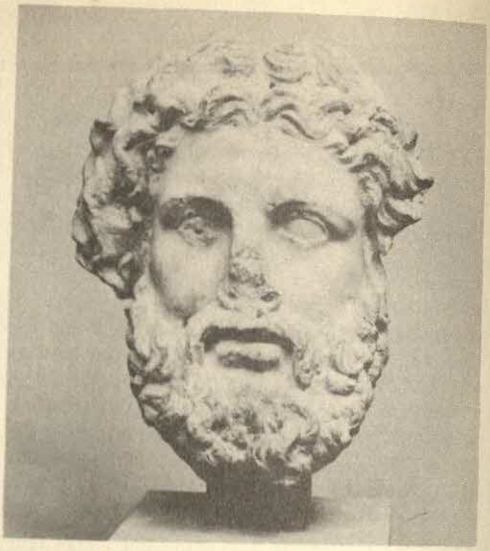
In the measurement of electrical potential for an electrode against a solution, since it is impossible to measure the value directly, a standard electrode and standard concentration of solution are selected and arbitrarily assigned the potential of zero. The potentials of other electrodes and solutions are then evaluated with reference to this standard.

Zerubbabel (*zẹ-rŭb′ȧ-bẹl*), Hebrew, meaning "disperse," a governor of Judah, fl. in the 6th century B.C. He led the Jews when they returned from the Babylonian Captivity *ca.* 537 B.C., and, encouraged by Haggai and Zechariah, he was influential in the rebuilding of the Temple.

Zeus (*zūs*), in Greek mythology, the chief deity and king of the gods, omnipotent and all-present. He was the son of the Titan Cronus and of Rhea, brother of Poseidon and Hades, and brother and husband of Hera. Zeus was specifically a sky god, controlling thunder and lightning, storms, rain and snow, heat and cold. After expelling his father and the Titans from the throne, he assumed absolute control but appointed Poseidon as god of the sea and gave Hades control of the infernal regions. The top of Mt. Olympus, a lofty mountain between Thessaly and Macedon, was believed to be the home of Zeus, where he was hidden from mortal view by the clouds and mist. He was worshiped chiefly at Dodona, in Epirus, and Olympia, in Elis; the oak tree and the summits of mountains were sacred to him. In numerous legends, Zeus is portrayed as the lover of mortal women, including Semele, Danae, Leda, Alcmene, Thetis, and Io. Among his mortal children were Heracles (Hercules), Perseus, and Castor and Pollux; his immortal children included Athena, Apollo, Artemis, Hermes, the Muses, the Graces, Hebe, Persephone, and Ate. Zeus was afterward identified with the Ammon of Libya and the Jupiter (*q.v.*) of the Romans.

Zeuxis (*zūḳ′sĭs*), a painter of ancient Greece, who flourished near the end of the 5th century B.C. It is thought that he was born in Heraclea, on the Euxine Sea, *ca.* 450 B.C., but nothing is certain as to the dates of his birth or death. The greater part of his life appears to have been spent at Ephesus, and he seems to have visited Athens and the southern part of Italy. Cicero, Lucian, and Pliny speak of him. Zeuxis is always mentioned in connection with Parrhasius (*q.v.*), both of them being the competing masters of the Ionic school of Greek painting during the 5th century.

Zeyer (*tsī′ēr*), JULIUS, poet and novelist, born in Prague, Bohemia (now Czechoslovakia), April 26, 1841; died there, Jan. 29, 1901. Although German was the language of his upbringing, all of his literary work was written in the Czech language. After traveling widely in Europe and studying at Prague Univ., he settled in Prague as a writer. He wrote epic poems on themes from Czech antiquity and medieval French romance. His prose writings include a semiautobiographical novel, "Jan Maria Plojhar" (1888), and "Three Legends of the Crucifix" (1895).



Courtesy of the Metropolitan Museum of Art, N. Y.

ZEUS

Hellenistic marble bust

Zhdanov (*zhdȧ′nôf*), a seaport city of the U.S.S.R., formerly called Mariupol, in the southeastern Ukrainian S.S.R., on the north shore of the Sea of Azov, 60 m. w. of Taganrog. Zhdanov is the chief port of the Donets basin and has an extensive trade in coal, salt, iron ore, and grain, as well as an important iron and steel industry. There are also chemical, canning, and shipbuilding industries. The city was founded in 1779. In World War II it suffered heavy damage and was occupied by the Germans from October 1941 through August 1943. Population, 1939, 222,427.

Zhdanov (*zhdȧ′nôf*), ANDREI ALEKSANDROVICH, politician and soldier, born in Mariupol (now Zhdanov), Ukraine, Feb. 12, 1896; died in Moscow, Russia, Aug. 31, 1948. A member of the Bolshevik wing of the Russian Social-Democratic party from his youth, he was appointed (1934) secretary of the Leningrad district of the Communist Party and became (1939) a member of the Politburo. In World War II he directed the campaign against Finland (1939-40) and, with Voroshilov (*q.v.*), the defense of Leningrad (1941-43). After becoming (1946) chairman of the Supreme Soviet, he announced (1947) the formation of the Cominform (see *Communism*).

Zhukov (*zhōō′ḳôf*), GEORGI KONSTANTINOVICH, Red Army officer, born in Strelkova, Russia, *ca.* 1895. A soldier from 1915 onward, he served in the imperial Russian army in World War I, joining the revolutionary forces in 1917. Later, he studied at an academy for Red Army officers specializing in the strategy and tactics of tank warfare. In World War II, after directing tank operations in the Finnish campaign (1939-40), he rose to the rank of chief of staff in February 1941 and directed operations in the defense of Moscow against the Germans in 1941, later taking over the command of the central front. Made first vice commissar of defense in August 1942, he was influential in planning the defenses of Stalingrad and Leningrad (October 1942-January 1943). In January 1943, he was made a marshal of the Soviet Union and, in 1944, became commander of the First White Russian Army. His forces invaded Germany and conquered Berlin, and he served as Russian member of the Allied Control Council of Germany, 1945-46. In November 1946, he was transferred to the command of the Odessa military district; but upon Stalin's death in 1953, he was named first deputy minister of defense and in 1955 became minister of defense. Although highly praised for his wartime victories for many years, he was ousted from his Communist party and government posts in 1957, allegedly for trying to remove the army from party control.

Courtesy Wide World Photos

GEORGI K. ZHUKOV

Ziegfeld (*zĭg'fēld*), FLORENZ, theatrical producer, born in Chicago, Ill., March 21, 1869; died in Hollywood, Calif., July 22, 1932. His first production was "A Parlor Match" (1896), starring Anna Held, whom he married in 1897. Beginning in 1907, he produced annually until 1930 the "Ziegfeld Follies," elaborately staged and costumed musical revues, featuring a chorus of beautiful girls. Other shows which he produced included "Sally" (1920), "Show Boat" (1927), "Rio Rita" (1927), and "Bitter Sweet" (1929). He was divorced (1913) from Anna Held and married the actress Billie Burke in 1914.

Zieten (*tsē'tẹn*) or ZIETHEN, HANS JOACHIM VON, soldier, born in Wustrau, Brandenburg, Prussia, May 14, 1699; died in Berlin, Jan. 26, 1786. He received a military education and enlisted (1720) in an infantry regiment in the Prussian army. Later he became a cavalry officer and served as a general under Frederick the Great in the War of the Austrian Succession and the Seven Years' War.

Zile (*zĭ-lĕ'*), a town in north central Turkey. In ancient times it belonged to the kingdom of Pontus and was called Zela. Here, in 67 B.C., a Roman army was routed by Mithridates VI (*q.v.*). In 47 B.C. Julius Caesar defeated Mithridates' son, Pharnaces II, at Zela and sent to the Roman senate his famous report, "I came, I saw, I conquered." Zile has a population of *ca.* 15,000.

Zimbabwe (*zĭm-bä'bwä*), a ruined city in Southern Rhodesia, southeast Africa. Discovered by white men in 1871, it was at first thought to be the Old Testament city of Ophir. Later thought, however, placed it as a Bantu city dating from A.D. 1400 or 1500.

Zimbalist (*zĭm'bȧ-lĭst*), EFREM, violinist, born in Rostov-on-Don, Russia, May 7, 1889. He studied first under his father, then went (1901) to the St. Petersburg Acad. as a student of Leopold Auer, making his debut in 1906 at St. Petersburg (now Leningrad). In 1907 he began a tour of the leading cities of Europe and England; he made his first appearance in the U.S. in 1911 with the Boston Symphony Orchestra. In 1941, after many years of concert tours in Europe and the U.S., he was named director of the Curtis Inst. of Music in Philadelphia, Pa. After the death of his first wife, the singer Alma Gluck (*q.v.*), he married (1943) Mary Louise Curtis Bok, founder of the Curtis Inst.

Zimri (*zĭm'rī*), in the Old Testament, the fifth king of Israel. He reigned for seven days after he had murdered King Elah. When the army learned of the murder, they deposed Zimri, proclaiming their general, Omri, king (I Kings 16:9).

Zinc (*zĭngk*), a silvery white metal of atomic number 30, atomic weight 65.38. The pure metal is used extensively, as it does not rust in air but becomes coated with a protective film of basic zinc carbonate. It also forms many useful alloys, the best-known being brass, which may contain from 2 to 36 per cent of zinc, the balance being mainly copper.

The chief ore is zinc blende, or sphalerite (zinc sulfide, ZnS), found in Missouri. Zinc is prepared by roasting the ore to form zinc oxide, ZnO, and then smelting it by heating it with coke to 800-1,000° C. The zinc is released as a vapor and condensed to a liquid, or to zinc dust. A purer zinc is prepared electrolytically from a solution of zinc sulfate.

Pure zinc melts at 420° C. and boils at 906° C.;

its density is 7.14 grams per c.c. Chemically, it is an active metal. It releases hydrogen readily from acid solutions and forms salts in which it is bivalent (Zn^{++}), such as zinc sulfate, $ZnSO_4$, and zinc chloride, $ZnCl_2$. It also combines with such elements as sulfur, the halogens, and oxygen.

Zinc is used extensively as a protective coating for sheet iron, iron wire, pipes, and other objects. The coat may be applied by dipping the object (carefully cleaned) in molten zinc (galvanizing), by placing powdered zinc on the surface and heating till the zinc fuses together (sherardizing), or by electroplating. The zinc coating protects the iron by excluding air and moisture, but even if the coating is broken, the zinc still provides "sacrificial" protection, since it is more active than iron and corrodes first.

Zinc oxide is used in rubber products, paint, ceramics, and ointments. Zinc chloride is used as a wood preservative for railroad ties, and lithopone, a mixture of zinc sulfide and barium sulfate, is used as a white pigment.

Zinc Etching (*zĭngk ĕch′ĭng*), in graphic arts, a method of etching in which a zinc plate is used. See also *Etching.*

Zinc White (*zĭngk whīt*), ZINC OXIDE, ZnO, an ingredient of white paint. The substance is prepared, for most uses, by burning zinc vapor in air and collecting the particles of zinc oxide formed. The process involves the roasting of the sulfide to zinc oxide, which is then mixed with coke and heated. The zinc oxide is reduced to zinc vapor and this burns again to zinc oxide in presence of excess of hot air blown over the mixture. For pharmaceutical purposes the oxide is prepared by precipitating zinc sulfate with sodium carbonate, followed by washing and drying.

Zinc oxide is insoluble in water. At room temperature it is white in appearance but at elevated temperatures it becomes a sulfur yellow, returning to white on cooling. The substance when used in paint has not as great a covering power as lead sulfate, but has the advantage that it does not darken on exposure to hydrogen sulfide (H_2S) in the air.

Zinc oxide is used primarily as a white pigment in paints. However, it is used extensively as a filler in rubber, particularly in automobile tires. When mixed with zinc chloride, it is used in dentistry as a quick-setting paste, and in the pure state is made into an ointment of pharmaceutical value. The substance is also used as an absorbent in surgical dressings, and as a powdered compound for polishing glass.

Zinnia (*zĭn′ĭ-ȧ*), a genus of plants of which several varieties are cultivated as garden annuals. They are easily grown and produce rather coarse heads of flowers with pink, yellow, white, purple, or red colors. They possess no fragrance. About 16 species are native to Mexico and the states of the United States that border on Mexico.

Zinoviev (*zē-nô′vyĕf*), GRIGORY EVSEEVICH, political leader, born in September 1883, at Elisavetgrad (later Zinovievsk, now Kirovograd), Russia; executed Aug. 25, 1936, in Moscow. He became a member of the Social Democratic party (1901) and joined (1903) Lenin in organizing its Bolshevik wing. In 1908, he was arrested for his revolutionary activities and on his release left the country, to return only in 1917. During this interim he continued his work, helping Lenin to organize the Russian labor movement from Galicia and participating in the formation of the Communist International. After the Revolution, he became president of the Leningrad Soviet of Workers and a member of the *Politburo* and was elected president of the Third International in 1919. After Lenin's death in 1924, Zinoviev, Kamenev, and Stalin ruled the Soviet Union together, but by 1926 Stalin had begun to acquire principal power and Zinoviev was expelled from the Politburo and the leadership of the Third International. The following year he was removed from the presidency of the Leningrad Soviet and expelled from the Communist party itself. He was taken back into the party in 1928, but in 1934 he was imprisoned. During 1936, at the so-called Moscow Trials, he was charged with the murder of Sergei Kirov, Stalin's lieutenant, and conspiring with Trotsky to overthrow the government. He was convicted and executed.

Zinzendorf (*tsĭn′tsẹn-dôrf*), NICHOLAS LEWIS, COUNT, bishop, born in Dresden, Germany, May 26, 1700; died in Herrnhut, May 9, 1760. He studied in Halle and Wittenberg, where he took courses in science, literature, and theology. He left Wittenberg (1719) to travel in Holland and France, and subsequently published "Pilgrimage of Atticus Through the World." He established a settlement on his estate for Protestant refugees, naming it Herrnhut. At that place John Wesley (*q.v.*) received his religious inspiration and formulated plans to conduct missionary work in America. In 1739, Count Zinzendorf visited the missionary fields of the West Indies; he came to New York in 1741, and soon after went to Pennsylvania, where he visited the Moravian colony and founded Bethlehem. He published many hymns and sermons.

Zion (*zī′ŭn*), formerly Zion City, a city of Lake County, Illinois, 40 m. N. of Chicago, on Lake Michigan and on the Chicago & North Western and other R.R.'s. It has manufactures of lace and candy products. The chief buildings include the Zion Home (a hotel), and the Zion Auditorium, where a Passion play is produced for three months every year. Zion was founded, by John Alexander Dowie, in 1900 and incorporated in 1902. Population, 1950, 8,950.

© *United Palestine Appeal*

ZIONISM. JEWISH COLONY OF KIRYATH ANAVIM

One of the many agricultural settlements in Palestine

Zionism (*zī′ŭn-ĭz′m*), an international movement, founded by Dr. Theodore Herzl in the late 19th century with the purpose of creating "for the Jewish people a home in Palestine secured by public law." After centuries of yearning for an ancestral homeland, the Jewish spirit had flared up in reaction to anti-Jewish riots and legislation in Russia in the 1880's and '90's. The precursor of modern Zionism was called the Lovers of Zion Society (*Chovevei Zion,* founded in Odessa, Russia, 1882), which promoted practical Jewish colonization in the Holy Land. Zionism proper came into existence in 1896, and the first World Zionist Congress met in Basel, Switzerland, in 1897. Its program was based largely on Dr. Herzl's pamphlet of 1896, "The Jewish State." In order to attain the desired "publicly recognized and legally secured home in Palestine," these first Zionists advocated "the promotion of the settlement of Jewish agriculturists, artisans, and tradesmen in Palestine."

The spread of Zionism and its organizations among world Jewry was accompanied by a gradual influx of Jewish settlers into Palestine, under Turkish rule until World War I, when the British forces under Gen. Allenby conquered Palestine. During the war the Jewish population, which had reached 100,000, diminished sharply due to hampered emigration and lack of funds. However, Zionists' hopes for achievement of their goal seemed fulfilled when Great Britain, pressed by political necessity and influenced by Zionist leaders such as Dr. Chaim Weizmann (*q.v.*) issued the *Balfour Declaration* (1917). This document promised British support of a Jewish national homeland in Palestine. In 1920, at the San Remo Conference, it was confirmed by the chief Allied Powers, and in 1922 was approved by the council of the League of Nations, which also granted Great Britain a mandate over Palestine. In the joint American-British Convention of 1924, the U.S. also voiced its agreement to the provisions of the Balfour Declaration as expressed in the mandate.

A new influx of Jews into Palestine soon began. Funds collected from organizations all over the world and modern equipment for many fields of endeavor (industry, education, agriculture, construction, science, electrification, sanitation) were imported to further the program of the Jewish settlers. Monuments to their achievements are the reclaimed desert lands transformed into cooperative farms, reforestation, the modern all-Hebrew city of Tel Aviv, the Palestine Philharmonic Orchestra, the Hebrew Univ. Jewish immigrants came from various parts of the world, and amounted to over 600,000 by 1946, their ranks swelled by European Jews who sought in Palestine a refuge from Nazi persecution.

The native Arabs expressed vigorous opposition to this mass immigration, at first largely for religious, but later also for political, reasons, the Arabs fearing that they would be outnumbered. Resistance of the Arabs to the Jewish settlers began to manifest itself in unrest and sporadic violence in 1929. In order to determine the authenticity of conflicting reports concerning Arab attacks and Jewish defense, a series of British investigating committees, such as the Peel Commission (1937) and the Woodhead Commission (1938) were sent to Palestine. The former advocated the division of Palestine into separate Arab and Jewish states with a neutral strip ruled by Britain; the latter declared such a partition impractical. The British government, as holder of the mandate, then offered its own solution to the problem by issuing the MacDonald White Paper (1939), which, contrary to the promises of the Balfour Declaration, rejected the idea of a Jewish state in Palestine, sharply limited Jewish immigration, and restricted the purchase of land by Jews. The White Paper was declared contrary to the provisions of the mandate by the Mandates Commission of the League of Nations in 1939, but it remained in effect throughout the war, and effectively barred the doors of Palestine to thousands of homeless and refugee Jews from Europe. The refugee problem became so acute after World War II that President Truman of the U.S., in 1945, asked the British government to permit the immediate entry of 100,000 Jews into Palestine. In January 1946, a 12-man joint Anglo-American commission studied the situation at first hand in Europe and Palestine, unanimously seconded President Truman's recommendation, and further suggested that precautions be taken to prevent the domination of Jews by Arabs or vice versa. These recommendations were not accepted by Great Britain, which sought to substitute a plan for the federalization of Palestine into Jewish and Arab provinces, under a central British government.

Continued Jewish immigration under Zionist auspices and bitter resistance to the British troops by the Jewish underground caused Britain to submit the Palestine problem to the United Nations in 1947. After lengthy deliberations, the U.N. voted (Nov. 29, 1947) to partition the country and establish independent Jewish and Arab states. The British accordingly terminated their mandate and the Jewish population proclaimed (May 14, 1948) the independent state of Israel within the area defined by the U.N.

At the first policy-making session of the World Zionist Actions Committee held in Israel thereafter (Aug. 1948), it was agreed that there was no organic relationship whatsoever between the world Zionist movement and the government of Israel. The government would be sovereign in its territory, while the Zionist movement would continue to be a cultural-philanthropic body expressing the interest of Jews everywhere in their ancestral homeland. It was also decided to give increased attention to the renaissance of Jewish values and Jewish culture among Jews outside of Israel. At the same time the Committee planned a vast educational program along both religious and secular lines.

Dr. Chaim Weizmann (*q.v.*), for many years president of the World Zionist Organization, was elected first president of Israel; he held this position, which includes little executive power, until his death in 1952. See *Israel; Palestine*.

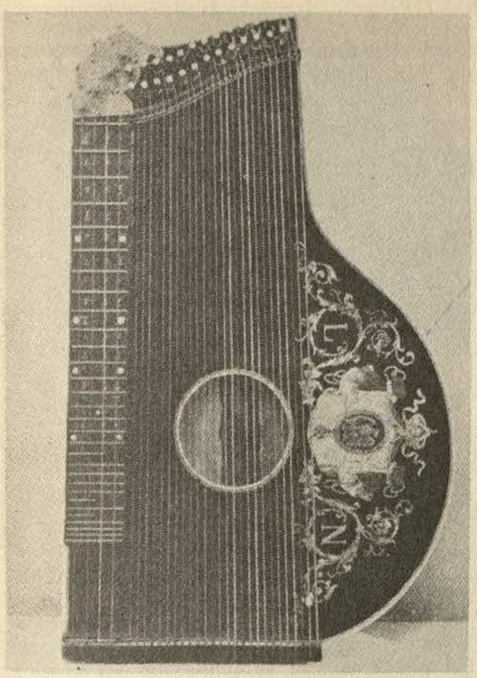
Zion (*zī'ŭn*), MOUNT, a hilly range in Jerusalem, forming the southwest part of that city. Toward the southwest it descends quite abruptly into valley of Hinnom. Many of the Old Testament writers speak of Jerusalem as Zion, and frequently refer to it as the Daughter of Zion. It is supposed to be the Salem associated with Melchisedek, who is spoken of in Genesis 14:18. For all Christian as well as Jewish denominations, Zion has become a symbol for Jerusalem (*q.v.*).

Zion National Park (*zī'ŭn năsh'ŭn-ạl pärḳ*), Utah, one of the national parks of the Federal government, created in 1919. It has an area of 147 sq. m. The park is noted for its eroded sandstone cliffs and multicolored gorges. Zion Canyon, the chief and most spectacular gorge in Zion National Park, is about 14 m. long and varies in width from 1 m. to scarcely more than 1 yd. Its processes of erosion have covered a period of over 90,000,000 years, resulting in a depth of 3,000 ft. cut through red and white sandstone.

Zirconium (*zẽr-ḳō̆'nĭ-ŭm*), element No. 40 (Zr), a rare earth metal discovered by Martin H. Klaproth in 1789, so named because it was found principally in the mineral called zircon, a silicate of zirconium. It is found in the U.S., India, Madagascar and Brazil. John J. Berzelius (*q.v.*) first obtained zirconium in the isolated state in 1824. Gray, solid, and somewhat brittle, it is used in steel manufacturing, electronics, and photography.

Ziska (*zĭs'ḳä*), or ZIZKA, JOHN, Hussite leader, born near the castle of Trocsznov, Bohemia, about 1360; died at the castle of Przibislav, Oct. 11, 1424. He was descended from a noble family and became a page to King Wenceslas of Bohemia, but afterward joined the military service against the Teutonic Knights. In the decisive Battle of Grünwald, near Tannenberg, Germany, he fought on the losing side, but was highly rewarded by the king for great bravery. He was an adherent of the Hussite doctrine and, after the murder of John Huss, became eminent as an advocate of the new faith. In 1419, he was chosen as leader of the Hussites, largely because of his gallantry in the Hungarian wars against the Turks, and, when Emperor Sigismund attempted to obtain the throne of Bohemia, Ziska made a stubborn resistance. It soon became apparent that the conquest of Bohemia could not be accomplished, hence Sigismund proposed a treaty by which Ziska should succeed King Wenceslas as governor of Bohemia, that sovereign having died while the conflict was raging. However, Ziska died before the treaty was concluded and was buried at Czaslav.

Zither (*zĭth'ẽr*), a musical instrument, the modern successor of the ancient *cithara* of the Greeks and supposed to be identical with the psaltery mentioned in the Bible. The form is that of a flat stringed instrument, with a shallow resonance box, and two sound holes and 30 or more strings. The strings consist of five melody,



ZITHER, ABOUT 1850

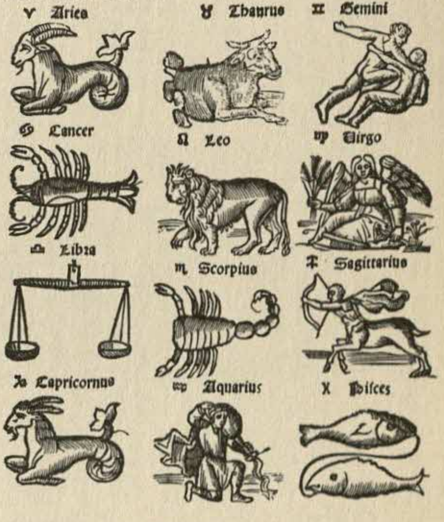
12 accompaniment, and 13 bass strings, made partly of metal and partly of gut and silk. In playing this instrument, it is placed on the knees or on a table, and the thumbs of both hands as well as the first, second, and third fingers are used. A partially open ring, used to strike the melody strings, is worn on the thumb of the right hand and takes the place of the bow used in playing the violin. The zither is very popular in the Tyrol and in Austria.

Zodiac (*zō′dĭ-ăk*), meaning "the circle of animals," an imaginary belt 16 degrees wide along the ecliptic or the sun's path across the sky. All large planets and the moon are always found within this belt, which is divided in 12 parts of 30 degrees each, called the *signs*. To each sign is attributed a *constellation,* usually bearing the name of an animal. The signs of the zodiac as they appear at present in relation to the seasons of the year are in the following order:

♈ Aries	Ram	Spring
♉ Taurus	Bull	
♊ Gemini	Twins	
♋ Cancer	Crab	Summer
♌ Leo	Lion	
♍ Virgo	Virgin	
♎ Libra	Balance	Fall
♏ Scorpio	Scorpion	
♐ Sagittarius	Archer	
♑ Capricornus	Goat	Winter
♒ Aquarius	Waterbearer	
♓ Pisces	Fishes	

When Hipparchus observed the constellations at Rhodes about 150 B.C., the equinoxial point from which the signs are counted was in the constellation of Aries which gave the name to the first sign. Spring then began when the sun entered Aries. Precession of the Equator has in the course of the centuries shifted the equinoxial point 30 degrees westward on the ecliptic so that now spring begins when the sun enters Pisces. Although the latter constellation now occupies the first *sign* the name Aries remains attached to this sign.

Many artists have treated the signs of the zodiac as subjects of fanciful representation. The design by an unknown artist as shown in "A Compilation of Leopold of Austria" in 1520 is illustrated below.



SIGNS OF THE ZODIAC

Zodiacal Light (*zô-dī′ȧ-kạl līt*), a faint glow of light seen along the line of the ecliptic when the sky is sufficiently dark after sunset or before sunrise in the morning. It tapers upward from its broadest point at the horizon and can be followed to a great height above the horizon under favorable circumstances. In our latitude the ecliptic is most nearly perpendicular to the western horizon in the winter and early spring. The zodiacal light is then best seen in the evening, when it rivals the intensity of the Milky Way. In the fall there is a corresponding favorable season for visibility in the eastern sky before sunrise, when it is sometimes called the false dawn. At other times atmospheric absorption cuts down the apparent brightness and the phenomenon, though present, is less conspicuous. Analysis of the light, which appears dull and diffuse in comparison with the sparkling light of the Milky Way, shows that it comes from reflected sunlight. It moves with the sun around the zodiac and is considered to be due to a great mass of small meteoric particles surrounding the sun in a broad belt in the general plane of the solar system.

Zohar (*zō′är*), a part of the Cabala (*q.v.*). It was written or compiled probably around 1300 in Spain by Moses de Leon and not, as the legend tells, in the 2nd century A.D. by Simeon ben Yochai. It is written in Aramaic and Hebrew and has the form of a commentary on the Pentateuch (*q.v.*). The Zohar consists of three parts. It contains many contradictions, unified only by one mystic concept of God and of the cosmogony (*q.v.*). Mixed with these mystical hints about the nature of the world, the human soul, etc., are ethical prescriptions as well as discussions of astrology and other kinds of magic (see also *Transmigration*). Neo-platonic, Gnostic, Aristotelian, and even Christian concepts have all quite obviously had their effect on its contents. The Zohar had much influence on the Jews throughout the Middle Ages and it has also later influenced certain Christian philosophers and thinkers as well as philosophers of the Renaissance.

Zola (*zō′lä*), ÉMILE, eminent novelist and founder of the naturalistic school, born in Paris, France, Apr. 2, 1840; died Sept. 29, 1902. His first works to attract attention were short stories, notably "Contes à Ninon." Before the publication of this book (1864), he had gone through periods of great economic strain. Now, however, he decided to become a professional writer, first as a critic and then as novelist. His "Thérèse Raquin" (1867) definitely established him as the leader of a new literary movement. He then began to write a series of novels dealing with the fate of various members of one family, the Rougon-Macquart. He integrated their lives with the most careful description of the general social and economic conditions as they prevailed in France during the last third of the century. Most famous in this series is "Le ventre de Paris" ("The Belly of Paris") published in 1874. Of his later novels, "Germinal" (1885) and "La terre" (1888), are outstanding works, as are those novels which center around cities such as "Lourdes," "Rome," and "Paris."

Zola can be compared to Henrik Ibsen (*q.v.*). While the latter introduced naturalism (*q.v.*) in playwriting, Zola is the founder of realistic naturalism in prose writing. His descriptions, carried by strong social compassion of a merciless intensity, heap detail on detail, and finally form a mosaic of pitilessly observed circumstances. The results of these observations of the masses' daily life are by no means exhilarating but they produce an impact of reality such as no writing before Zola had been able to evoke.

Zola's importance as literary leader was enhanced by the publication (1898) of his famous letter "J'accuse" ("I condemn"), a bitter political attack on the persecutors of Capt. Dreyfus (*q.v.*). When Zola died by an accident of asphyxiation, he was celebrated throughout the world as the accepted pioneer and leader of the naturalistic school which had engulfed the whole world and as a courageous fighter for justice against most unfavorable circumstances.

Courtesy of The Metropolitan Museum of Art, N. Y.

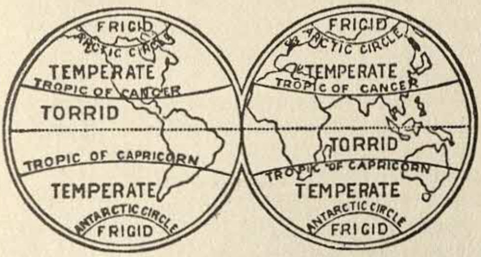
ÉMILE ZOLA

Medal by Alexandre Charpentier (1856-1909)

Zollverein (*tsôl′fĕr-īn*), a customs union (*q.v.*) established in 1818 by the German states under the leadership of Prussia, organized to equalize tariff rates. This commercial union paved the way to political consolidation and the establishment of the German Empire. At the formation of the empire, in 1871, several free cities were not included, but the free ports were brought into the union in 1888.

Zone (*zōn*), in common usage, a region distinguished by similar characteristics. A zone is frequently referred to as a belt, such as cotton belt or corn belt. In geography, a zone is a region of the earth enclosed between two parallels of latitude. The term is applied to one of the five divisions of the earth's surface, which take their names from the prevailing climate. They are the North Frigid Zone, North Temperate Zone, Torrid Zone, South Temperate Zone, and South Frigid Zone. Since the axis of the earth is inclined 23½ degrees to the plane of the ecliptic, the Arctic Circle is located at 66½° N. lat., or 23½° S. of the North Pole; conversely, the Antarctic Circle is located at 66½° S. lat., or 23½° N. of the South Pole. The areas within these zones are called the North Frigid Zone and the South Frigid Zone respectively. The Tropic of Cancer is located 23½ N. of the Equator and the Tropic of Capricorn 23½° S. of the Equator. The area between the Tropic of Capricorn and the Antarctic Circle is the South Temperate Zone, and the area between the Tropic of Cancer and the Arctic Zone is the North Temperate Zone. The area between the Tropic of Cancer and the Tropic of Capricorn is called the Torrid Zone. Therefore, measured from Pole to Pole, the Frigid Zones each have a width of 23½°; the Temperate Zones, each a width of 43°; and the Torrid Zone, 47°; making a total of 180°. In the illustration are shown the zone belts of the earth, together with the location of the land masses and oceans.

The term *zone* is applied in natural history to well-defined belts within which certain forms of animal or plant life are confined, as found in ascending mountains.



ZONE BELTS

Zoning (*zōn′ĭng*). See *City Planning.*

Zoölogical Garden (*zō-ô-lŏj′ĭ-kal gär′dẹn*), an enclosure maintained for the development and study of animal life, usually in connection with a public garden or park. In most cases they are owned and operated by the public or by zoölogical societies. In many cases the institutions include extensive collections of rare plants, usually brought together from many lands. Cincinnati, O., has one of the leading zoölogical gardens in America. In most cases the zoölogical collections are in parks, such as Lincoln Park, Chicago; Bronx Park, New York City; Highland Park, Pittsburgh; and Forest Park, St. Louis. The National Zoölogical Park at Washington, D.C., was established by Congress in 1889 and is under the direction of the Smithsonian Institution.

Zoölogy (*zō-ŏl′ô-jy̆*), (a word derived from the Greek *zoön,* "an animal," and *logos,* "discourse"), the branch of biology which embraces the study of animals with reference to their structure, functions, distribution, and classification. It is quite difficult to draw a precise line between zoölogy and botany for the reason that some organisms, low in the scale of life, are of such structure as to be classified by some writers as animals and by others as plants. The subject matter covering a large field, it is classified into various branches, and these are studied in many schools as distinct sciences. Even in ancient times man gave attention to the study of the lower animals. Thus, Solomon speaks of the habits of the ant, Jeremiah alludes to marine mammals, and Job refers to the peculiar method by which the ostrich incubates its eggs. Many zoölogical facts were recorded by Aristotle and Pliny, but no well-defined attempt was made at scientific classification of animals until the 18th century. However, many modifications have been made in the study and classification of animals, especially in the 19th century, and it is probable that there are still numerous errors to be rectified by the naturalists of the future.

The chief divisions of zoölogy include *mammalogy,* treating of mammals; *herpetology,* of reptiles and amphibians; *entomology,* of insects; *ornithology,* of birds; *ichthyology,* of fishes and lower aquatic vertebrates; *conchology,* of mollusks; *arachnology,* of spiders, scorpions, and related forms; *helminthology,* of worms; *crustaceology,* of the crustaceans; *spongiology,* of the sponges; and *protozoölogy,* of the protozoa. These departments were made in accordance with different forms of animal life. However, besides these may be mentioned certain divisions of the subject matter that refer to aspects in animal life which are applicable to any one or all life forms. Among these are *physiology,* treating of animal functions, such as nutrition, reproduction, and innervation; *anatomy,* which investigates the position and relation of organs and parts; *embryology,* dealing with development from the ovum to maturity; and *classification* or *taxonomy,* which classifies animals into natural groups. Among the names famous in zoölogical research are those of Agassiz, Darwin, Haeckel, Cuvier, Max Müller, Harvey, Johannes Müller, T. H. Huxley, and Linnaeus. See also *Amoeba; Animal; Birds; Ecology; Embryology; Fish; Insects; Mammalia; Reptiles; Vertebrate.*

Zoöphyte (*zō′ô-fīt*), the name applied by Cuvier to the forms of animal life that more or less resemble a plant in external form or mode of growth, as a coral, sponge, or polyzoan, and generally fixed to a definite object or spot, as a rock or shell. It has current usage as a popular name for the corals, sea anemones, and hydroids, but the groups originally included are now known to be widely separated. Many zoophytes have a close external resemblance to flowers, but they are true animals instead of plants.

Zorn (*tzôrn*), ANDERS LEONHARD, painter, etcher, and sculptor, born in Sweden in 1860; died in 1920. Although he traveled and worked in many foreign lands, spending some time in the U.S., the greater part of his distinctive art work was done in his native land. Outstanding are his excellent nudes of peasant women, which are characterized by great sensitivity, grace and beauty; his fine etchings of Marcel Proust, Paul Verlaine, Anatole France, and other prominent figures; and his sculptures including the bronze "Alma" and "Faun and Nymph."

Zoroastrianism (*zô-rô-ăs′trĭ-ạn-ĭz′m*), the religion developed by Zoroaster in Persia in the 2nd millennium B.C. The exact date cannot be fixed; even ancient Greek writers disagree. The teachings of Zoroaster as set forth in the Zend-Avesta (*q.v.*) were kept alive till about the time of the conquest of Persia by Alexander the Great (about 330 B.C.). From then on, the power of Zoroastrianism gradually decreased, although it did not disappear entirely before the 7th and 8th centuries A.D., after the Moslems had conquered Persia. At that time, the followers of Zoroaster were compelled to emigrate to India, where they became the Parsees (*q.v.*) of today. Actually the religion of the Parsees represents a modernized form of Zoroastrianism, continuously purified by careful examination by their own scholars.

The stories of ancient Greek writers about the life of Zoroaster are entirely legendary. Linguistic research ascribes to him as original only the Gathas of the Zend-Avesta.

Essential for Zoroaster is the juxtaposition of Ormazd (*q.v.*), the spirit of the good, and Ahriman, the spirit of the bad. Certain parts of the Zend-Avesta describe a kind of revelation of Ormazd to Zoroaster very similar to the revelation which Moses received from God. In the continuous struggle between Ormazd and Ahriman, in which the whole world, all living and dead things from planets and spirits to men and animals, participates, man has to choose. Zoroaster postulates that this choice can be indicated by thoughts, words and deeds. Eventually man, acting in a good way, will be rewarded by eternal life, since finally Ormazd will overcome Ahriman.

Actually, it could be said that Zoroastrianism already represents a monotheism with all its ethical consequences. Obviously, however, the pure teachings of Zoroaster, obedience to the commandments of God, prayer, and love of one's neighbor, were later on diluted by influences of the remnants of surviving Babylonian and Assyrian cults, and Medean Magi introduced their ceremonies and astrological rites. Thus, older gods began to surround Zoroaster, although he remained always the superior deity. These other gods obviously represented originally only personifications of the qualities and capacities of Zoroaster himself, and became later, through adaptation to the religious ideas of the surrounding people, actually independent deities. Correspondingly, evil gods surround Ahriman.

By stating that Ormazd created the good in the world and that his counterpart Ahriman created the bad, Zoroastrianism overcame the greatest theological problem of Christianity and Judaism: how God could create or tolerate evil. In contrast to the Judaeo-Christian monotheism, Zoroaster's monotheism conceives of the good and the bad creators as twins, of which the good one will finally prevail. The last judgment will reward all those men who, through their lives and deeds, have helped Ormazd to increase the sum total of the good on earth. The bad will go to hell. For those between good and bad, a kind of limbo is imagined.

It is surprising that such a clear-cut theological system could be diluted by relatively lower forms of religion (*q.v.*). Not only were the personifications of qualities of Ormazd and Ahriman, in the form of six good and six bad spirits or inferior gods, venerated, but, in later Parseeism, inherited ideas from older religions as well as from surrounding peoples found entrance into Zoroastrianism. A complicated demonology was invented and knowledge of it elevated the position of the priests.

All these influences brought so many foreign elements to the original teachings of Zoroaster that it is doubtful whether Parseeism in all periods of its development can still be defined as a form of Zoroastrianism.

Zorrilla y Moral (*thô-rēl′yä ē mô-räl′*), JOSÉ, poet and dramatist, born Feb. 21, 1817, in Valladolid, Spain; died Jan. 23, 1893, in Madrid. His first work to bring him attention was an elegy for the satirist, Mariano de Larra, on the latter's death in 1837. Thereafter, he published numerous poems and plays, winning wide acclaim, in 1841, for his "Cantos del trovador," a retelling of Spanish folk tales in verse. Most of his plays were adaptations of older works, but they were popular. In 1847 he left Spain to live in France and in 1855 emigrated to Mexico, where he remained until 1866. When he returned he had been almost forgotten and he lived in want for many years until a pension was awarded to him late in his life. At last a reaction set in in his favor and he was crowned national laureate in 1889. His plays include: "El Zapatero y el Rey," "Don Juan Tenorio," "Sancho Garcia," "El Rey loco," "El Alcalde Ronquillo," and "Traidor, inconfeso y mártir." Among his other works are an incomplete epic poem, "Granada," and his autobiography, "Recuerdos del tiempo viejo."

Zouave (*zŏŏ-äv′*), a light-armed infantryman, originally part of a corps recruited from the Kabyle tribe of Zouaoua, in Algeria, but now a part of the regular army of France. The French occupied Algiers in 1830, and incorporated the zouaves into their army, but later gradually eliminated the native element from the corps. After 1840 the zouaves were strictly French soldiers, bearing the native name and wearing the native dress. The apparel is Moorish, but the arms and discipline are European, and recruits are obtained by voluntary enlistment. On dress parade, Zouaves wear a loose jacket and waistcoat, usually of blue cloth which is ornamented with yellow braid, a yellow-tasseled fez cap, loose trousers, yellow leggings of leather, and white or yellow gaiters. During World War II, they wore the uniform of the French army. They are armed with carbines or rifles and carry a sword bayonet.

Zrinyi (*zrĭ′nyĭ*), surname of a noble Hungarian family of Croatian origin. NICHOLAS (Hungarian, MIKLÓS) ZRINYI (1508-66) won fame in the defense of Vienna (1529) against Sultan Suleiman I (see *Solyman I*) of the Ottoman empire and was governor of Croatia (1542-61). He was killed in another engagement against Suleiman I, defending Szigetvár with a garrison of 3,000. His great-grandson, NICHOLAS ZRINYI (1616-64), became governor of Croatia in 1647. A distinguished poet, he was among the first to write in the Hungarian language. Among his works is an epic poem on the defense of Szigetvár. He was killed in a hunting accident. PÉTER ZRINYI (1621-71), brother of the younger Nicholas, became governor of Croatia in 1665, but was executed after the failure of a conspiracy against Emperor Leopold I.

Zschokke (*chôk′ẹ*), JOHANN HEINRICH DANIEL, historian and novelist, born in Magdeburg, Saxony, March 22, 1771; died in Aarau, Switzerland, June 27, 1848. He was first an actor, then a pastor (1792) in Magdeburg, before settling (1798) in Switzerland, where he held various administrative positions. A prolific and versatile writer, Zschokke wrote a number of works on Swiss history, including a history of the Swiss Mountain and Forest Cantons (1801) and a popular history of Switzerland (1838). His novels, reminiscent of Sir Walter Scott's, include *"Die Prinzessin von Wolfenbüttel"* (2 vols., 1804) and "Goldenthal" (1833).

Zsigmondy (*zhĭg′môn-dē*), RICHARD ADOLF, chemist, born in Vienna, Austria, April 1, 1865; died in Göttingen, Germany, Sept. 23, 1929. Educated at the Univ. of Munich, he early specialized in colloid chemistry. He served (1908-29) as professor of chemistry at the Univ. of Göttingen. With an associate, H. F. W. Siedentopf, he designed (1903) the ultramicroscope, which made visible the composition of colloid solutions. For this achievement he was awarded the 1925 Nobel Prize in chemistry.

Zubly (*tsōō′blē*), JOHN JOACHIM, clergyman, born in St. Gall, Switzerland, Aug. 27, 1724; died in Savannah, Ga., July 23, 1781. He was educated in Switzerland and ordained (1744) a Presbyterian minister in London. Emigrating to America, he became (1760) a pastor in Savannah, Ga.; in 1770 he received the degree of doctor of divinity from Princeton Univ. He was a member of the provincial congress of Georgia and a delegate to the Continental Congress (1775). Although he supported opposition to British acts of oppression, he opposed a complete break with England. Accused in the congress of Tory sympathies, he returned to Savannah. Banished from Georgia in 1777, he was permitted to return when Sir James Wright was reinstated as royal governor in 1779.

Zuccaro (*tsōōk′kä-rō*) or ZUCCHERO, surname of a family of Roman painters. OTTAVIANO ZUCCARO, who lived in the early 16th century, is noted chiefly as the teacher of his two sons. TADDEO ZUCCARO (1529-66) executed notable murals in the Mattei Palace, Rome, and became painter to the popes Julius III and Paul IV. Among his outstanding frescoes are a series in the palace at Caprarola illustrating the achievements of the Farnese family. FEDERIGO ZUCCARO (1543-1609) studied with his elder brother. Commissioned by Pope Gregory XIII to execute murals in the Pauline Chapel, he fell into disgrace and fled the country. In 1574 he went to England, where he painted portraits of Queen Elizabeth I, Mary Stuart, and others. Returning to Rome, he completed his work in the Pauline Chapel. He was the founder and first president of the Acad. of St. Luke in Rome.

Zuider Zee (*zī′dẽr zē*), a former inlet from the North Sea, on the northern coast of The Netherlands, with an area of *ca.* 1,350 sq. m. or 860,000 acres. It formed a marshy lake at the time of Roman occupation, when it was called Flevo Lake; a small river carried the water to the sea. Near the entrance to the inlet are the four islands of Terschelling, Vlieland, Ameland, and Texel. Heavy storms swept the waters against the shores of the lake, increasing its area steadily until dikes prevented further enlargement.

Reclamation of a large part of the Zuider Zee was begun in 1922. In 1927 the construction of an enclosing dam was undertaken from the island of Wieringen to the coast of the province of Friesland. The dam was finished on May 28, 1932, after which the Zuider Zee was called IJssel Meer (meer meaning "lake"), after the IJssel River which flows into the lake. The first section to be reclaimed was the Wieringermeer, which has a current area of about 118,000 acres. This "polder" (an area needing protection by dikes against high sea or river water) was dry on Aug. 21, 1930. The second part, an area of about 120,000 acres called the northeast polder, was dry in 1942. In September 1956 work on the third polder, 133,000 acres to be called Eastern Flevoland, was started. Two more sections also were to be reclaimed—Markerwaard (also begun in 1956) and Southern (or Western) Flevoland—with a total area of 244,000 acres.

Zuloaga (*thōō-lô-ä′gä*), IGNACIO, painter, born in Eibar, Spain, July 26, 1870; died in Madrid, Oct. 31, 1945. He left the Basque region to study architecture in Rome, Italy, but soon turned to painting and before he was 20 settled in Paris, France. His work, however, is pure Spanish, as are his subjects—bullfighters and peasants, gypsies and beggars, in somber colors with brilliant highlights. Among his paintings are "Victims of the Fiesta" (in the Metropolitan Museum) and a portrait of Paderewski (in Steinway Hall, New York City).

Zulu (*zōō'lōō*), a South African Negro people of the Bantu linguistic stock, inhabiting Natal, southern Transvaal, and southern Orange Free State of the Union of South Africa. They are noted for their high degree of physical and intellectual development. The Zulus first rose to prominence under King Shaka, who ruled from 1816 to 1828 and established a great empire. Shaka's successors came into conflict with the Boer settlers (1836), and after several massacres the Zulus became vassals of the Boer state of Natal. In 1874 the Zulu king Cetewayo resumed hostilities. After inflicting several defeats on the British forces, he was forced to submit (1879). Since the beginning of the 20th century, there have been no serious Zulu disturbances. The society of the Zulus has deteriorated greatly. Many of the men leave home to work in the mines of Johannesburg and other cities; those who remain practice cattle herding and subsistence agriculture. The Zulu population is estimated at 2,000,000, divided into about 20 independent tribes.

Zululand, with an area of 10,425 sq. m., is a district of the province of Natal in the Union of South Africa, situated between Natal proper and Mozambique and bounded on the E. by the Indian Ocean. Its chief town is Eshowe (pop., *ca.* 2,200). Population, *ca.* 375,000.

Zumárraga (*thōō-mär'rä-gä*), JUAN DE, prelate, born near Durango, Vizcaya, Spain, in 1486; died in Mexico City, Mexico, June 3, 1548. A member of the Franciscan order, he was appointed (1527) first bishop of Mexico. As Protector of the Indians, he did extensive missionary work, particularly seeking to stop the practice of human sacrifice. At his order, great quantities of Aztec manuscripts were burned as heretical. Zumárraga helped to obtain the first printing press in the Western Hemisphere, and his religious tracts were printed on it. His see was raised to an archbishopric in 1548, shortly before his death.

Zuñi (*zōō'nyē*), a tribe of Pueblo Indians constituting the Zunian linguistic stock, living in McKinley and Valencia counties, in central west New Mexico. Most of them inhabit a single permanent pueblo called the Zuñi Pueblo, but a few live in three neighboring farming villages. Their then seven pueblos, first seen by Fray Marcos in 1539, were visited by Coronado in 1540 and subsequently by other explorers. The Zuñis participated in the 1680 revolt against the Spaniards, and the present main village was built in 1695, following that event. Most of them are farmers, although there are a few outstanding silversmiths. The Zuñi tribe currently numbers *ca.* 2,400.

Zunz (*tsōōnts*), LEOPOLD, scholar and historian, born in Detmold, Lippe, in 1794; died in Berlin, Germany, in 1886. He studied at the universities of Berlin and Göttingen, served as a rabbi at Berlin and Prague, and became educational adviser to the Prussian government. His life work, however, was the foundation (1823) of the *Journal for the Science of Judaism,* in which he sought to combine theological research with the history of the Jews, the sociology of Judaism, and research in Jewish literature. Thus he was the last of the series of great figures in German Judaism, starting with Moses Mendelssohn (*q.v.*), who tried through more than a century to amalgamate the essence of Jewish thought and civilization with European culture. Of his many books and papers on Jewish theology and literature, the monograph (1832) on Rashi, an 11th-century French-Jewish Bible commentator, and that on synagogical poetry of the Middle Ages (1855) are most important.

Zurich (*zōōr'ik*), in German, ZÜRICH, a city in Switzerland, capital of the canton of Zurich (668 sq. m.; pop., 1950, 777,002), on the Lake of Zurich at the mouth of the Limmat River. It is the largest and commercially most important city of Switzerland, and its industries include machine works, foundries, paper and textile mills, and printing and publishing. Other manufactures are soap, candles, and tobacco and leather products. Zurich is the intellectual center of German-

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speaking Switzerland, the seat of a university (founded 1832), a polytechnical school, and several museums. Among the city's historic buildings are two churches—the Grossmünster (begun in the 11th century) and the Fraumünster (13th century)—and the 17th-century town hall. Zurich is on one of the oldest continuously occupied sites of Europe (the dwellings of Neolithic lake dwellers have been found here). Conquered (58 B.C.) by the Romans, the city was held successively after the 5th century by various Germanic tribes. In 1218 it became a free city of the Holy Roman Empire and in 1351 joined the Swiss Confederation. The Swiss Reformation, headed by Ulrich Zwingli (*q.v.*), begun in Zurich. Population, 1950, 390,020.

The LAKE OF ZURICH is separated by a promontory and dam into two parts. It is *ca.* 25 m. long, 2.5 m. wide, and 470 ft. deep.

Zweibrücken (*tsvī-brüḳ'ẹn*), in French, DEUX-PONTS, a town in Germany, in the *Land* (state) of Rhineland-Palatinate, formerly in Bavaria. Among its manufactures are textiles, machinery, shoes, and leather and rubber goods. Historic buildings include the 15th-century Alexanderkirche and an 18th-century castle. Zweibrücken was chartered in 1352; in 1410 it became the seat of the counts (later dukes) palatine of Zweibrücken. It belonged to Sweden from the ascension to the throne (1654) of Charles X Gustavus until the death (1718) of Charles XII. It passed to Bavaria in 1815. The town suffered heavy damage in World War II and was later occupied by the French. Population, 1950, 25,766

Zweig (*tsvīḳ*), ARNOLD, novelist, born in Gross-Glogau, Germany, Nov. 10, 1887. Educated at various German universities, he began writing early in life; his first stories were published in 1909. In World War I he served as a private in the German army. His first novel, "The Case of Sergeant Grischa" (1927), deals with the impact of war on the individual and has been called the finest novel to come out of World War I. Because of his Zionist activity, Zweig was exiled and his property confiscated (1933) by Nazi Germany. After 1934 he lived in Palestine (now Israel), the locale of his novel "De Vriendt Goes Home" (1933). Among his other works are "Young Woman of 1914" (1931), "Education Before Verdun" (1936), and "The Axe of Wandsbek" (1946).

Zweig, STEFAN, author, born in Vienna, Austria, Nov. 28, 1881; died (a suicide) in Petropolis, Brazil, Feb. 22, 1942. The son of a wealthy merchant, he was educated at Vienna Univ. and in his youth met such prominent literary figures as Hugo von Hofmannsthal, Émile Verhaeren, and Romain Rolland. Zweig lived in Salzburg from 1913 until 1934, when he was driven into exile by the Nazi threat. Thereafter he lived in London, New York, and Brazil, where, at last, overcome by grief for what he felt was a permanently lost European culture, he and his second wife committed suicide. Zweig is best known as a biographer; his principal fame in that field rests on his "Romain Rolland" (1920), "Joseph Fouché" (1929), and *"Balzac. Der Roman seines Lebens"* (1946). His work is less characterized by innate creative power than by the ability to revive great periods and personalities of the past. Depicting the actions of sophisticated intellectuals under abnormal circumstances, Zweig thus re-created not so much heroes in action as great figures suffering from conflicts with the external world.

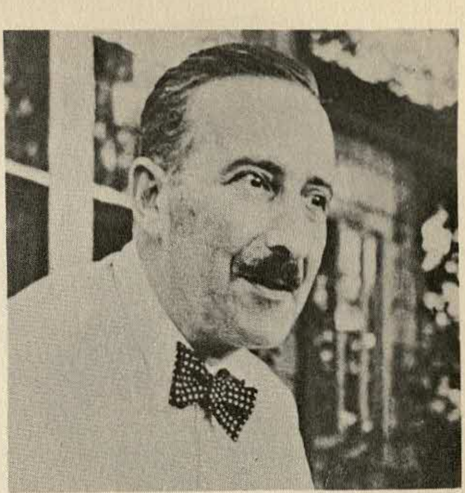

Photo by S. Hoeller, courtesy The Viking Press, N. Y.

STEFAN ZWEIG

Zweig's other writings include the plays "Jeremias" (1917) and "Volpone" (an adaptation from Ben Jonson, 1927); stories and novels, such as "Amok" (1923) and "Conflicts" (1927); and a posthumously published autobiography, "The World of Yesterday" (1943).

Zwickau (*tsvĭḳ'ow*), a city in Germany, in the former *Land* (state) of Saxony, on the Mulde River, *ca.* 42 m. s. of Leipzig. Located in a coal-mining region, the city produces mining equipment and other machinery, automobiles, textiles, paper, chemicals, and pianos. Its historic buildings include the 14th-century Church of St. Catherine and the 15th-century basilica and town hall. Zwickau was chartered in 1212 and passed to Saxony in 1348. It was the center of the Anabaptists (*q.v.*) led by Thomas Munzer and suffered heavy damage in the Thirty Years' War. It was the birthplace of Robert Schumann (*q.v.*). Population, 1946, 122,862.

Zwingli (*tsvĭng'lē*), ULRICH OF HULDREICH, Protestant reformer, born in Wildhaus, Switzerland, Jan. 1, 1484; died in battle, Oct. 11, 1531. After studying in Basel, Bern, and Vienna he was pastor in Glarus, Einsiedeln, and after 1518 in

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Zurich. Influenced by the writings of Erasmus, but independently from Martin Luther, he preached the ultimate authority of the Bible over later doctrinal additions. He repudiated fasting during Lent and tithing as not founded in the Scriptures, and he demanded simplification of the liturgy, changes of the rules governing the monasteries, and other reforms. He expounded his thoughts in 67 theses, which were accepted by the Council of Zurich, and in the Holy Week of 1525 Zwingli served for the first time the Lord's Supper in two forms, *i.e.*, including the Cup. Like Luther, however, he opposed the radical demands of the peasants and the Anabaptists (*q.v.*).

Zwingli, who was more interested in practical political and religious reforms than in theological speculations, refused to accept Luther's doctrine of the real presence of Christ in the Eucharist and interpreted it instead as a merely symbolic act of remembrance. A meeting with Luther in Marburg, brought about by Prince Philip of Hesse in 1529, only emphasized the differences. The failure of this conference was the beginning of a fateful split in the ranks of the Protestants. In opposition to Luther's theology, Zwingli also taught, in his book "On True and False Religion" (1525), that election by God precedes faith and that redemption is attained by following the example of Jesus rather than by atonement.

Although adversely criticized for advocating civil war in defense of the faith and common rights, Zwingli expressed the view that there should be religious liberty and that to defend freedom of worship was battling for the cause of Christ. He believed strongly in the study of the Bible as the immediate Revelation of God and recognized the writings of the early Doctors of the Church but always emphasized the higher authority of the revelation as represented in the Bible.

Zwingli's attempts to spread the new Protestant and democratic order through all Switzerland succeeded only in the larger towns, but he was fiercely opposed by the Four Forest Cantons. This conflict led (1531) to war, and in the battle of Kappel on Oct. 11, Zwingli, who wore armor, but did not participate in actual combat, was slain. Zurich, deserted by its former allies, was defeated. Zwingli's doctrines, however, survived in the First and Second Helvetic Confession (1536 and 1562, respectively).

Zwolle (*zvôl'ẹ*), a city in The Netherlands, capital of the province of Overijssel (area, 1,318 sq. m.; pop., 738,019), near the IJssel River, about 50 m. N.E. of Amsterdam. The city is a rail and canal shipping center; and its industries include shipbuilding, flour-milling, iron foundries, and the manufacture of chemicals and paper products. Among historic buildings are the town hall and the churches of St. Michael and of Our Lady, all dating from the 15th century. Population, 1957 (est.), 54,087.

Zworykin (*zwôr'ĭ-ḳĭn*), VLADIMIR KOSMA, physicist and electronics engineer, born in Murom, Russia, July 30, 1889. He was educated in Russia and at the Collège de France in Paris. In 1919 he came to the U.S., was naturalized (1924), and received a Ph.D. (1926) from the Univ. of Pittsburgh. He was a research worker with the Westinghouse Electric and Manufacturing Co. (1920-29), director of electronic research of the Radio Corp. of America (1929-42), and, after 1947, vice president and technical consultant of R.C.A. With his fellow workers he developed the Iconoscope, or electric eye, of the television camera, and the Kinescope, or viewing tube, of the television receiving apparatus. Zworykin is the author of "Photocells and Their Application" (1934), "Television" (1940), and "Photoelectricity and Its Application" (1949).

Zygote (*zī'gōt*), in biology, the fertilized egg, formed by the union of two mature germ cells (ovum and sperm).

Bibliography
and
Atlas

Introduction to the Encyclopedia Bibliography

The following list of books will assist those seeking further information on subjects included in the Encyclopedia. Because it has been newly prepared, it includes primarily books published during the last decade, thus enabling the researcher to make use of the most recent works in his particular field of interest.

As shown in the following list of subject headings:

General
Arts
History, Biography, Travel
Language
Literature
Philosophy
Religion
Sciences
Technology

there are nine main groups, arranged alphabetically after the first, or General, group, which covers such standard references as dictionaries and almanacs. Each main group, in turn, contains a General section and subunits, arranged alphabetically. In the main groups, the unit termed General lists histories, surveys, or other books dealing with the subject in a broad, general way. The subdivisions cover interrelated fields. The Graphic Arts unit, for example, is divided into Drawing and Design; Painting and Painters; and Printing and Photography. In the Zoology unit, instead of following alphabetical order, the subunits are arranged by zoological classification, proceeding from the lower to the higher forms of life, keeping allied topics together. For easy reference to a certain subject in the bibliography, the reader is advised to consult the Alphabetical List of Subject Headings.

For readers accustomed to work in libraries, the numbers of the Dewey system of classification, used in most public and school libraries, have been added in parentheses after the group headings and most of the subheadings. Books in any number range may be located in libraries with open shelves by observing the shelf labels or by enlisting the aid of the librarian.

All books in this bibliography have been accepted by authorities as including current and accurate information. In the fields of Sciences and Technology, particular effort has been made to choose the most up-to-date material.

For every title listed, the following valuable information is provided: the author or editor; the publisher and publication date; the size, indicated by the number of pages; whether or not the book contains illustrations or photographs; an annotation describing how the book deals with its subject; and, in some cases, a comment on its style and authorship. In addition, bold-face letters—**C, I,** or **A**—at the end of each entry, show whether the book is intended primarily for children, intermediates (older children or teen-agers), or adults. Other abbreviations used in the bibliography are explained in the Key to Abbreviations.

Key to Abbreviations and Signs Used in the Bibliography

A	for adult readers	illus.	illustrated or illustrations
abr.	abridged	pp.	pages
C	for young readers	photos	photographs
col.	color or colored	rev.	revised
comp.	compiled	trans.	translator
ed.	edited or edition	U.S.	United States
I	intermediate; for teen-aged readers	vols.	volumes
		...	part of the title omitted

The names of publishers have been given in short form, as is standard practice; however, each name is easily recognized.

Alphabetical List of Subject Headings in the Bibliography

Acting. See *Public Entertainment*
Adolescence. See *Personal Conduct; Psychology*
Adoption. See *Social Welfare*
Aeronautics, 27
Africa, travel, 8. See also *History: Foreign*
Agriculture, 25. See also *Public Administration: Federal Government*
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America. See *North America; South America*
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Exploration, Underwater. See *Caves; Earthquakes; Rivers; Rocks; Sciences: General; Sea; Volcanoes; Weather*
First Aid. See *Medical Sciences: General and Physiology*
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GENERAL (000–039)

Includes books about books and reading, bibliographies, libraries, and dictionaries

World Almanac and Book of Facts (New York World-Telegram, annual). Current events; facts and statistics of general interest. **C, I, A**

Information Please Almanac (Macmillan, annual). Current events; facts and statistics of general interest. **C, I, A**

Webster's Third New International Dictionary, 3d ed. (Merriam, 1961), 56a, 2662 pp. Unabridged and including sections on capitalization, forms of address, italicization, plurals, pronunciation, punctuation, and spelling. **I, A**

Webster's Biographical Dictionary (Merriam, 1958), xxxvi, 1,697pp. Names of noteworthy persons, with pronunciations and concise biographies. **C, I, A**

Webster's Geographical Dictionary; rev. ed. (Merriam, 1959), xxxi, 1,293, xxivpp. maps. Names of 40,000 places, with geographical and historical information, and pronunciations; table of foreign-language equivalents of English geographical terms. **C, I, A**

New Century Cyclopedia of Names, ed. by Clarence L. Barnhart with the assistance of William D. Halsey and others...(Appleton, 1954), 3 vols., 4,342pp. Information on over 100,000 persons, places, events, books, plays, operas, and works of art. **C, I, A**

Dictionary of Classical Antiquities; Mythology, Religion, Literature, Art, by Oskar Seyffert; rev. and ed. by Henry Nettleship and J. E. Sandys (Meridian, 1956), 716pp. illus. **C, I, A**

Famous First Facts; a Record of First Happenings, Discoveries, and Inventions in the United States, by Joseph N. Kane; 2d ed. (Wilson, 1950), 888pp. Alphabetical subject arrangement with four indexes: geographical; chronological by year, and by day of the month; persons connected with events. **C, I, A**

Encyclopedia of American Facts and Dates, ed. by Gorton V. Carruth and associates (Crowell, 1956), 708pp. Chronologically arranged. **I, A**

Popular Guide to Government Publications, by William P. Leidy (Columbia Univ., 1953), 296pp. 2,500 titles on popular topics, arranged under 100 headings. **I, A**

Books That Changed the World, by Robert B. Downs (A.L.A., 1956), 200pp. illus. Describes how history and thought have been affected by 16 books on mathematics, sciences, politics, economics, and morality. **I, A**

Wonderful World of Books, ed. by Alfred Stefferud; illus. by Robert Osborn (Houghton, 1953), 319pp. Articles by teachers, publishers, writers, and librarians on how to read intelligently, how to find time for reading, how to improve reading skill, and how to find the books you want. **I**

Find It Yourself! A Brief Course in the Use of Books and Libraries, by Elizabeth Scripture and Margaret R. Greer; rev. ed. (Wilson, 1955), 64pp. Eight lessons on the library, covering classification, parts of a book, dictionaries, encyclopedias, card catalogue, and "Readers' Guide." **C, I**

New Library Key, by Margaret G. Cook (Wilson, 1956), 136pp. Describes services of a library and use of the card catalogue, indexes, reference books, and nonbook materials. **I, A**

Books, Libraries, and You, by Jessie E. Boyd and others (Scribner, 1949), 143pp. illus. Suggestions on improving study habits, with information on the parts of a book, the use of reference books, and the organization of books in a library. **C, I**

Mending Books Is Fun, by Brooke Byrne (Burgess, 1956), 162pp. illus. A full course in book repair, written by a librarian in nontechnical language; glossary. **I, A**

For other dictionaries and cyclopedias see the subject, as *Arts, Athletics, Music*)

ARTS (700–799)

Includes architecture, carving and modeling, graphic arts, handicrafts, music, public entertainment, and recreation

General

Principles of Art Appreciation, by Stephen C. Pepper (Harcourt, 1949), 326pp. illus. Discusses the basic principles of design, contrast, theme, and restraint which combine to form any significant work of art in any medium. **A**

Treasures to See; a Museum Picture-Book (Harcourt, 1956), unpaged. Describes the main divisions of an art museum, and the kind of things to be found there. **C**

Rainbow Book of Art, by Thomas Craven (World, 1956), 256pp. illus. History of the art of the world, with stories ot the artists. **C**

500 Years of Art and Illustration, from Albrecht Dürer to Rockwell Kent, by Howard Simon (World, 1942), 476pp. illus. A picture book with brief text. **I, A**

Art Through the Ages, by Helen Gardner; 4th ed. rev. under the editorship of Sumner McK. Crosby by the Dept. of the History of Art, Yale Univ. (Harcourt, 1959), 840pp. illus. col. plates. Reviews all known art in chronological order. Extensive bibliog. at end of each topic. **A**

Art Today; An Introduction to the Fine and Functional Arts, by Ray Faulkner and others; 3rd ed. (Holt, 1956), 553pp. illus. bibliog. Deals with architecture, painting, and sculpture, in both their fine and applied forms. **A**

Sense of Beauty; being the Outlines of Aesthetic Theory, by George Santayana (Mod. Lib., 1955), 268pp. A new printing of this classic lecture series. **A**

Encyclopedia of the Arts, ed. by Dagobert D. Runes and Harry G. Schrickel (Philosophical Library, 1946), 1,064pp. Defines and describes terms and topics of all arts in all ages and places. **I, A**

New-York Historical Society's Dictionary of Artists in America, 1564–1860, by George C. Groce and David H. Wallace (Yale, 1957), xxvii, 759pp. Entries when possible include name, date and place of birth and death, media and subject matter of work, chronology of residence, exhibitions, and pupils. **I, A**

Architecture (720–729)

Space, Time, and Architecture; The Growth of a New Tradition, by Sigfried Giedion; 3rd ed. (Harvard, 1954), xxii, 778pp. illus. photos, maps. A nontechnical discussion of the development of architecture throughout the world. **I, A**

From the Ground Up; Observations on Contemporary Architecture, Housing, Highway Building, and Civic Design, by Lewis Mumford (Harcourt, 1956), 243pp. Essays that appeared in the "*New Yorker*" between 1947 and 1955. **A**

Architecture, Ambition, and Americans, by Wayne Andrews (Harper, 1955), xxv, 315pp. photos. Famous buildings in the U.S., the men who designed them, and the people for whom they were built. **I, A**

Record Houses of 1957, by *Architectural Record* (periodical) (Dodge, 1957), 286pp. illus. A selection of house designs from 25 architectural firms, plus a section on special parts and details of the house. **A**

Guide to Early American Homes, by Dorothy and Richard Pratt (McGraw, 1956), 2 vols. illus. Descriptions of homes, original and present owners, features of special interest, and whether open to the public. **I, A**

Photographic Record of 100 Selected Designs for Small Commercial Buildings . . ., by Richard W. Snibbe (Reinhold, 1956), 216pp. Designs of buildings erected within the last 20 years throughout the world. **A**

School Planning and Building Handbook, by N. L.

Englehardt and others (Dodge, 1956), 626pp. illus. maps. Discusses all kinds of school buildings, from location surveys through construction and financing. **A**

(See also *Home Planning* and *Remodeling)*

Carving, Ceramics, Sculpture (730–39)

Sculpture Through the Ages, by Lincoln Rothschild (McGraw, 1942), 278pp. 123 plates. History of sculpture, developed by means of plates and accompanying text, in Egypt, ancient and modern Europe, and Negro Africa. **A**

Practical Wood-Carving Projects, text and illus. by Enid Bell (Harper, 1940), 144pp. Explains use of the tools, and gives designs for a number of articles. **I, A**

Technique of Wood Sculpture, by Chaim Gross; photos by Eliot Elisofon and others (Vista, 1957), 136pp. Information on tools, equipment, and workroom needs, and on methods of carving. **I, A**

Ceramics, by Vincent A. Roy (McGraw, *in press*) Presents the essentials of ceramics for the beginner. **I, A**

The Ceramics Handbook, by N. R. Hyman (Sterling, 1953), 144pp. illus. Basic steps in making typical wares, especially figurines. **I, A**

How to Make Pottery and Ceramic Sculpture, by Julia H. Duncan and Victor D'Amico (Museum of Modern Art, 1947), 96pp. illus. Instructions for making 20 objects, by hand, and without the use of special tools. **I, A**

Anyone Can Sculpt, by Arthur Zaidenberg (Harper, 1952), 157pp. illus. Subtitle: A Book of Established and New Methods and Techniques for Amateurs and Students. Directions for the use of clay, plasteline, stone, wood, wire, soap, and paper. **C, I, A**

Mask Making; Creative Methods and Techniques, written and illus. by Matthew Baranski (Davis, 1954), 101pp. Directions for making head and wall masks and marionette heads from papier-maché and other materials. **C, I, A**

Papier-Maché, by Lillian Johnson (McKay, 1958), 88pp. illus. Step-by-step instructions for creating amusing or serious figures in this medium. **I, A**

Clay, Wood, and Wire; a How-To-Do-It Book of Sculpture, by Harvey Weiss (Scott, 1956), 48pp. illus. Step-by-step directions for making various kinds of sculpture from various media. **C**

Graphic Arts (740–744, 750–779)

Includes drawing, painting, photography, and printing

Drawing (740–744)

Modern Prints and Drawings; A Guide to a Better Understanding of Modern Draughtsmanship, by Paul J. Sachs (Knopf, 1954), 261pp. 286 illus. bibliog. Beginning with 18th-century David, deals with artists of the 19th and early 20th centuries, and briefly with the more recent. **I, A**

Index of American Design, by Erwin O. Christensen (Macmillan, 1951), illus. 229pp. From the National Gallery of Art, Washington, D.C. Designs from clothing, quilts, dishes, toys, and other articles of early American use. **I, A**

Mechanical Drawing; a text with problem layouts, by Thomas E. French and Carl L. Svensen; 6th ed. (McGraw, 1957), 568pp. illus. This ed. has added chapters on reading and making drawings, and on electrical drafting. **I**

Technical Drawing, by Frederick E. Giesecke and others; 4th ed. (Macmillan, 1958), 844pp. illus. College text and reference book. **A**

Poster Design, written and illus. by Tom Eckersley (Studio, 1954), 96pp. The noted British designer advises on the technical and psychological requirements of successful posters. **I, A**

The Art Of Hand-Lettering; Its Mastery and Practice, by Helen Wotzkow (Watson, 1952), 320pp. illus. A handbook showing the five basic styles and their many variants; how to draw the letters and how to compose lettering. Also contains a section on handwriting. **I, A**

Costume Drawing, by Hazel R. Doten and Constance Boulard; 2d ed. (Pitman, 1956), unpaged, illus. Also shows outstanding features of clothing from ancient Egypt to the present day. **I, A**

Landscape Sketching, by Arthur Black (McGraw, 1950), 109pp. illus. Instruction on fundamental strokes, perspective, values, planes, shadows, and composition. **I, A**

Painting and Painters (750–759)

Story of Painting for Young People, by Horst W. and Dora J. Janson (Abrams, 1952), 164pp. illus. The development of painting from the prehistoric cave pictures to modern times. **C, I**

Harper History of Painting; The Occidental Tradition, by David M. Robb (Harper, 1951), 1,006pp. 500 illus. 16 col. plates, bibliog. glossary. European and American painting from the cave pictures to Picasso, as it reflects events and culture. **I, A**

Painting in America; the Story of 450 Years, by Edgar P. Richardson (Crowell, 1956), 447pp. illus. Includes every painter of lasting significance. **I, A**

New Art in America; Fifty Painters of the 20th Century, ed. by John I. H. Baur and others (N. Y. Graphic Soc., Praeger, 1957), 280pp. illus. Grouped in three chronological sections; where possible, new statements were obtained from the artists of their aims, methods, and convictions. **I, A**

Post-Impressionism from Van Gogh to Gauguin, by John Rewald (Mus. of Modern Art, 1956), 615pp. 500 plates. Life and work of Van Gogh is the main topic, but Gauguin, Seurat, and Redon are also discussed. **A**

Artist's Handbook of Materials and Techniques, by Ralph Mayer; rev. ed. (Viking, 1957), 721pp. illus. Explains chemistry of materials, new developments and materials, and older practices now regaining popularity. **I, A**

Watercolor Painting Step-by-Step, by Arthur L. Guptill (Watson, 1957), 128pp. illus. Based on articles in the *American Artist* Magazine. **I, A**

How to Paint in Oil; a Beginner's Book for Boys and Girls, by Arthur Zaidenberg (Vanguard, 1956), 55pp. illus. **C**

Oil Painting for Everyone, by Frank Slater (Scribner, 1958), 96pp. col. plates. Based on the premise that everyone interested can develop skill; gives basic information on the use of oil paint and the various types of paintings. **I, A**

Guide to Landscape Painting, by John F. Carlson; rev. ed. (Sterling, 1958), 144pp. illus. Oil painting techniques illus. by spring, summer, and fall scenes. **I, A**

Art and Technique of Portrait Painting, by Frederic Taubes (Dodd, 1957), 113pp. illus. An aesthetic interpretation of the art, and a discussion of the practical knowledge necessary to its success. **I, A**

Printing and Photography (760–779)

Pioneers in Printing, by Seán Jennett (Routledge, 1958), 196pp. illus. Essays describing the difficulties met by the inventors of printing methods in gaining acceptance and financial backing. **I, A**

Graphic Arts Procedures, by Robert R. Karch; 2d ed. (Am. Tech. Soc., 1957), 383pp. illus. Chapters on the many parts of publishing, from copy preparation to proofreading; a synopsis of graphic art terms. **A**

Practical Introduction to the Graphic Arts, by Hartley E. Jackson (McGraw, 1957), 286pp. illus. Covers basic processes in hand composition and press work, bookbinding, linoleum-block cutting, silk screen printing, and photography. **I**

Modern Japanese Prints; an Art Reborn, by Oliver Statler, with an introduction by James A. Michener (Tuttle, 1956), xxi, 209pp. 102 illus. Comments on some 30 artists and their methods. **I, A**

The Family of Man; The Photographic Exhibition by Edward Steichen for the Museum of Modern Art (The Museum, 1955), 207pp. photos. 500 photos of people in 68 countries, showing their common human experiences. **C, I, A**

Successful Photography, by Andreas Feininger (Prentice, 1954), 249pp. illus. Subtitle: A Complete Home Course in the Mechanics, Techniques, and Applications of Photography. **I, A**

35 mm. Photo Technique; Miniature Camera Practice, by Henry S. Newcombe; 12th ed. (Focal, 1958), 326pp. illus. Explains the requirements for obtaining fine enlargements. **I, A**

Story-Telling Home Movies, How to Make Them, by Leo Salkin (McGraw, 1958), 257pp. illus. Tells how to develop ideas, and how to translate the story into a simple shooting script. **I, A**

Handicrafts and Things to Make (745–749)

Golden Book of Crafts and Hobbies, by W. Bernard Hunt (Simon, 1957), 111pp. illus. Information on camping, collecting, nature study, and making small articles. **C**

Build-It-Yourself Book for Boys (Popular Mechanics, 1956), 192pp. illus. Directions for making all kinds of things, from kites to ship and railroad models. **C, I**

American Folk Art, text and drawings by Ellen S. Sabine; col. photos by Hilda Borcherding (Van Nostrand, 1958), 132pp. How to reproduce and adapt designs from early American sources. **I, A**

Pick-Up Needlework, by Marguerite Kohl and Frederica Young; illus. by Cynthia Rockmore (McKay, 1955), 285pp. Directions for making small articles or those that can be made in small sections. **I, A**

Handbook of Christmas Decoration, text and illus. by Dorothy Waugh (Macmillan, 1958), 143pp. Instructions for making both modern and traditional decorations from inexpensive and easy-to-obtain materials. **I, A**

Candle Book; How to Make, Decorate, Decorate With, and Sell Candles, by Carli Laklan (Barrows, 1956), 190pp. illus. Also includes a history of candles, and the customs and traditions concerning them. **I, A**

Kites; How to Make and Fly Them, text, illus. and photos by Marion Downer (Lothrop, 1959), 64pp. Diagrams and instructions for building 11 kinds of kites. **C, I**

Modeling with Balsa, by Ron Warring (Sterling, 1959), 48pp. illus. Drawings and step-by-step instructions for many articles. **C, I, A**

How to Make Origami; the Japanese Art of Paper Folding, by Isao Honda; illus. by Kazuo Tsukamoto (McDowell, 1959), 37pp. Besides instructions, includes paper models, and a supply of colored paper. **C, I, A**

Do It Yourself with Aluminum, by G. W. Birdsall (McGraw, 1955), 136pp. 250 illus. Instruction to the home craftsman for making more than 100 items. **I, A**

Fun with Wire, by Joseph Leeming (Lippincott, 1956), 96pp. illus. How to make household articles, Christmas decorations, etc., with wire. **C, I**

Square Knot Handicraft Guide, by Raoul Graumont and Elmer Wenstrom (Cornell Maritime, 1949), 212pp. How to use the sailor's square knot to make bags, dog leashes, mats, etc. **I, A**

Indian Beadwork, written and illus. by Robert Hofsinde (Gray-Wolf) (Morrow, 1958), 122pp. illus. How to construct a bead loom and to work out attractive bead designs; patterns for various articles. **C, I**

Jewelry Making for Fun and Profit, by Helen Clegg and Mary Larcom (McKay, 1951), 162pp. illus. photos. Handbook on making jewelry out of copper, gold, brass, wire, shells, etc. **I, A**

(See also *Interior Decorating; Aeronautics* for airplane models; *Railroads* for train models, etc.)

Music (780–789)

Includes biographies of musicians, discussion of instrumental and vocal music

History of Music, by Theodore M. Finney; rev. ed. (Harcourt, 1947), 720pp. illus. music in text. From music of the ancient Greeks and early Christians to American jazz. **A**

The Oxford Companion to Music, by Percy A. Scholes; 9th ed. (Oxford, 1955), 1,195pp. illus. music in text. Biographies of composers and artists in every aspect of music. Plots of 50 operas. **I, A**

What to Listen For in Music, by Aaron Copland; rev. ed. (McGraw, 1957), 307pp. music. The emphasis is on modern compositions; chapter on film music. **I, A**

The Concise Encyclopedia of Music and Musicians, ed. by Martin Cooper (Hawthorn, 1958) 516pp. 160 illus. 16 col. plates. Gives brief biographies of composers, performers, critics, and others connected with music; describes various instruments and forms of music, important opera houses and concert halls. **A**

Essays on Music, by Albert Einstein (Norton, 1956), 265pp. illus. Notes and bits of history on many musical compositions, especially opera. **A**

Operas and Musical Comedies, by Joseph W. McSpadden; 3rd ed. (Crowell, 1955), xxv, 636pp. music. Material grouped by countries and then chronologically. **I, A**

Our American Music; 300 Years of It, by John T. Howard; 3rd ed. with chapters by James Lyons (Crowell, 1954), 841pp. bibliog. A reference book listing American composers and song writers, grouped chronologically. Complete index. **I, A**

Men of Music; Their Lives, Times, and Achievements, by Wallace Brockway and Herbert Weinstock; rev. ed. (Simon, 1950), 649pp. 22 plates. Biographies of European composers of the 19th and 20th centuries. **I, A**

Instrumental Music (785)

Score Reading, Book I. Orchestration, Book II, Musical Form, by Roger Fiske (Oxford, 1959) Book I, 72pp.; Book II, 104pp. Contains 29 scores of movements from simple pieces of orchestral music, with instructions for reading the music while it is played on records. **I, A**

Encyclopedia of Jazz, by Leonard G. Feather (Horizon, 1955), 360pp. illus. music. A biographical dictionary of jazz musicians; other information. **I, A**

Shining Trumpets; A History of Jazz, by Rudi Blesh; rev. ed. (Knopf, 1958), 410pp. music index. Story of jazz from New Orleans to New York. **I, A**

From These Comes Music; Instruments of the Band and Orchestra, by Hope Stoddard; illus. by Ava Morgan (Crowell, 1952), 256pp. music in text. Describes 40 instruments used in present-day bands and orchestras, and their development. **I, A**

Woodwind Instruments and Their History, by Anthony Baines (Norton, 1957), 382pp. illus. music. Early forms of woodwind instruments; existing instruments; techniques. **I, A**

Bands of America, by Harry W. Schwartz (Doubleday, 1957), 320pp. illus. music. History of famous bands and their conductors. **I, A**

Conducting an Amateur Orchestra, by Malcolm H. Holmes (Harvard, 1951), 128pp. illus. music. Suggests methods of organizing and maintaining an amateur orchestra, training it, and enlarging its repertory. **I, A**

Marching Bands; How to Organize and Develop Them, by Kenneth Hjelmervik and Richard C. Berg (Ronald, 1953), 301pp. illus. music. Includes suggestions on providing an interesting program, planning and achieving drill formations, and training drum majors. **I, A**

Make Your Own Musical Instruments, by Muriel Mandell and Robert E. Wood; illus. by Margaret

Krivak (Sterling, 1957), 126pp. Easy directions for making a variety of musical instruments from articles around the house, and instructions on playing each instrument. **C**

Songs (784)

National Anthems, by Paul I. A. Nettl; translated by Alexander Gode (Storm, 1952), 216pp. The sources and backgrounds of the major national anthems of the world, with texts in both the original language and English. **I, A**

Cat Came Fiddling, and Other Rhymes of Childhood, adapted and made into songs by Paul Kapp; illus. by Irene Haas (Harcourt, 1956), 80pp. music. 57 nursery rhymes and nonsense verses. **C, I, A**

Panorama of American Popular Music . . ., by David Ewen (Prentice, 1957), 365pp. Subtitle: The Story of Our National Ballads and Folk Songs, the Songs of Tin Pan Alley, Broadway, and Hollywood, New Orleans Jazz, Swing, and Symphonic Jazz. **I, A**

Best Loved American Folk Songs, comp. by John and Alan Lomax (Grosset, 1953), 423pp. music. Grouped by type of song, such as spirituals, railroad songs, cowboy ditties, and the like; each group with an introduction by the authors. **C, I, A**

Favorite Christmas Carols, selected by Margaret B. Boni; arranged for piano by Norman Lloyd; illus. by Peter Spier (Simon, 1957), 128pp. music. Historical notes on each carol. **C, I**

Choir ideas for Choir Members, Directors, Preachers, and Congregations, by Flora Breck (Wilde, 1952), 142pp. How to organize and maintain a choir; selecting the music; congregation singing. **I, A**

Public Entertainment (791–792)

Includes amateur dramatics, ballet, theater, and the circus (for texts of professional plays, see *Literature*)

The Theatre; Three Thousand Years of Drama, Acting, and Stagecraft, by Sheldon Cheney; rev. ed. (Longmans, 1952), 592pp. 278 illus. A reference book in narrative form, describing the earliest forms of dramatic art, the modern Western theater and the society that supported it, and very recent developments. **A**

The Theatre in Our Times; A Survey of the Men, Materials, and Movements in the Modern Theatre, by John Gassner (Crown, 1954), 609pp. illus. Discusses modern drama types, American playwrights, and the relationship of the theater to the moving pictures. **A**

Actors on Acting; The Theories, Techniques, and Practices of the Great Actors of All Times as Told in Their Own Words, ed. with introd. and biogr. notes by Toby Cole and Helen K. Chinoy (Crown, 1954), 596pp. bibliog. Begins with Greek and Roman comments, continues through medieval and modern Europe, the U.S.S.R., and the U.S. through Howard Lindsay. **A**

Tall Tales and Tall Men, by Nellie McCaslin; illus. by Clifford Schule (Macrae, 1956), 238pp. Twelve one-act plays dealing with American heroes, mythical and real; production notes given for each play. **C, I**

A Treasury of Christmas Plays; Royalty-Free Stage and Radio Dramas for Young Players, ed. by Sylvia E. Kamerman (Plays, 1958), 509pp. Forty one-act plays of different types, grouped by school years. **C, I, A**

Act It Out, by Bernice W. Carlson; illus. by Lazlo Matulay (Abingdon, 1956), 160pp. music. Dramatic presentations of all kinds, games, plays, pantomimes, and puppet shows. **C**

How to Have a Show, by Barbara Berk and Jeanne Bendick (Watts, 1957), 63pp. illus. How to put on shows, parades, pageants, pet shows, and sports competitions. **C**

Teen Theatre; A Guide to Play Production and Six Comedies, by Edwin and Nathalie Gross (McGraw, 1953), 245pp. illus. Describes all the jobs necessary to production of a play, including business arrangements and publicity. **I**

A Stage Crew Handbook, by Sol. Cornberg and Emanuel Gebauer; illus. by Jack Forman; rev. ed. (Harper, 1957), 291pp. For both amateurs and professionals; gives specific directions for each job, and also for the designer and technical director. **I, A**

Staging the Play, by Norah Lambourne (Studio, 1956), 95pp. illus. Covers types of stages, curtain settings, lighting, set construction and design; glossary of materials. **I, A**

Fun with Puppets, by Sylvia Cassell; illus. by Frances Johnston (Broadman, 1956), 113pp. How to make both hand and string puppets; how to build different types of stages; how to put on puppet plays. **C, I, A**

Ballet for Beginners, by Nancy Draper and Margaret F. Atkinson (Knopf, 1951), 115pp. illus. music. For beginners at any age; explains basic ballet positions and practice methods; summarizes some ballets for children. **C, I, A**

Circus, from Rome to Ringling, by Marian Murray (Appleton, 1956), 354pp. illus. photos. History of the oldest of public entertainments, from the Egyptian parades, the Roman spectacles, and the medieval fairs to the United States and the detailed stories of Barnum and of the seven Ringling brothers. **I, A**

Circus Doctor, by J. Y. Henderson, as told to Richard Taplinger (Little, 1951), 238pp. illus. Experiences of the author in treating ailments and injuries of wild animals; facts about the operation of a circus and the life of the performers. **C, I**

Wild Tigers and Tame Fleas, by William Ballantine (Rinehart, 1958), 344pp. illus. Tells of the careers of 13 animal trainers and the animals they trained, from pigs to tigers, lions, snakes, and fleas. **C, I, A**

The Outdoor Amusement Industry, by William F. Mangels (Vantage, 1952), 206pp. illus. The history of amusement parks in the U.S. by the inventor of many of the riding devices. **C, I, A**

Vaughn's Parade and Float Guide, by Leroy F. Vaughn, and others (Denison, 1956), 162pp. illus. Information on planning and staging a parade, and designing and building floats. **I, A**

Recreation (793–799)

Includes athletics, camping and outdoor activities, collecting, and other hobbies, indoor games, magic and puzzles, parties and dancing, and sports

Athletics and Gymnastics (796)

Encyclopedia of Sports, by Frank G. Menke; cartoons by Willard Mullin; rev. ed. (Barnes, 1953), 1,018pp. Historical facts about indoor and outdoor sports and games; rules, records, lists of champions. **C, I, A,**

Official Encyclopedia of Baseball, ed. by Hy Turkin and S. C. Thompson; rev. ed. (Barnes, 1959), 583pp. illus. All-time Major League players' register; World Series highlights; Hall of Fame roster; averages for more than 9,000 players. **C, I, A**

Story of the Olympic Games, 776 B. C.–1956 A.D., by John Kieran and Arthur Daley (Lippincott, 1957), 520pp. illus. index. Frequently rev. to bring it up to date. **C, I, A**

History of American Football; its Great Teams, Players, and Coaches, by Allison Danzig (Prentice, 1956), 525pp. illus. Begins with first intercollegiate game in 1869; includes outstanding team records and AP yearly ratings. **C, I, A**

Balance and Rhythm in Exercise, by Maja Carlquist and Tora Amylong; trans., Madeleine Hamilton; illus. by Georg Lagerstedt (Viking, 1951), 144pp. Gives directions for elementary gymnastics. **A**

Basketball for Girls, by Wilhelmine Meissner and Elizabeth Meyers (Barnes, 1950), 89pp. illus.

Basic principles, evolution of rules, details as to courts, and techniques of playing are given. **I**

Scientific Basketball; for Coaches, Players, Officials, Spectators, and Sportswriters, by Howard Hobson; 2d ed. (Prentice, 1955), 267 pp. illus. Suggestions for scouting a basketball team, and for setting up efficiency ratings for both player and team. **I, A**

Bowling for All, by Joe Falcaro and Murray Goodman; 3rd ed. (Ronald, 1957), 104pp. illus. Includes American Bowling Congress and National Duck Pin Congress rules and regulations. **I, A**

Tennis Techniques Illustrated; designed and illustrated by Tyler Micoleu, by Wynn Mace (Ronald, 1952), 96pp. illus. A book for beginners, by a tennis coach, presenting the subject in a simple way and discussing equipment as well as techniques. **I, A**

Tumbling Techniques, by Ted Burns; illus. by Tyler Micoleau (Ronald, 1957), 96pp. Covers the basic individual tumbling techniques. **C, I**

Camping and Outdoor Activities (796–799)

The Outdoor Encyclopedia; A Complete Guide to Outdoor Adventure, ed. by Theodore Kesting; illus. by William N. Ronin (Barnes, 1957), 433pp. 85 articles written by experts on all phases of camping, outdoor games, hiking, climbing, and similar activities. **I, A**

Canoe Camping; A Guide to Wilderness Travel, by Carle Handel (Barnes, 1953), 192pp. illus. Discusses planning the trip, using a canoe, packing, portaging, selecting campsites, and living off the land. **A**

Where Speed Is King, by Margaret and Edwin Hyde; illus. by Clifford N. Geary (McGraw, 1955), 144pp. Discusses all the major sports and games where speed has become king, with sketches and records of some of the champions. **C, I**

How to Have Good Fishing, by R. W. Eschmeyer and George Fichter (Harper, 1959), 124pp. illus. How to create, maintain, and improve conditions essential to good fishing; sound methods of conservation. **A**

Bucks and Bows, by Walter Perry (Stackpole, 1953), 223pp. illus. An archery fan gives advice on archery tackle, hunting equipment, and the technique of hunting deer with bow and arrow. **I, A**

The Encyclopedia of Golf, with the Official Records, by Nevin Gibson (Barnes, 1958), 256pp. illus. Covers history, data on courses, equipment, etiquette, records, and biographies. **I, A**

Advanced Golf, by Cary Middlecoff; ed. by Tom Michael (Prentice, 1957), 230pp. illus. Shooting under difficulties; the refinements and strategy of the game. **I, A**

Skiiing for Beginners, by Conrad Brown (Scribner, 1951), 63pp. illus. The Arlberg technique for children and their parents. **C, I, A**

Teach Your Child to Swim, by Gene Stephens (Exposition, 1956), 32 pp. illus. A handbook for parents and other teachers, with step-by-step illustrations. **A**

Collecting and Other Hobbies

Here's Your Hobby, written and illus. by Harry Zarchy (Knopf, 1950), 233pp. Describes many hobbies, including collecting butterflies, leaves, and postage stamps; keeping aquariums; shop work; painting; photography. **I, A**

Hammond's Guide to Nature Hobbies, by Emil L. Jordan (Hammond, 1953), 64pp. Covers collecting rocks and minerals, shells, and insects; plant hobbies; terrariums and aquariums; nature and wildlife photography. **I**

Adventures of an Autograph Collector, by Robert Williams (Exposition, 1952), 99pp. Subtitle: An Introduction to Collecting with Suggestions for Beginners. **I, A**

Coin Collectors' Handbook, by Fred Reinfeld; rev. ed. (Sterling, 1956), 127pp. illus. Information on buying and caring for coins; catalogs of U.S. and Canadian coins; short guide to identification of foreign coins. **C**

A History of Doll Houses; Four Centuries of the Domestic World in Miniature, by Flora Jacobs (Scribner, 1953), 322pp. illus. bibliog. **I, A**

Stamp Collector's Guide, by Harry Zarchy (Knopf, 1956), 178pp. Instructions on starting a stamp collection and on using a stamp catalogue. Dictionary of philatelic names and overprints; stamp identification table; glossary. **C, I, A**

Dictionary of American Antiques, by Carl W. Drepperd (Doubleday, 1952), 404pp. illus. More than 15,000 entries and almost 1,000 line drawings. **I, A**

(See also under subject—*Rocks, Shells, etc.*)

Indoor Games, Magic, and Puzzles (793–794)

101 Best Card Games for Children, by Alfred Sheinwold; illus. by Doug Anderson (Sterling, 1956), 128pp. Directions for playing many card games old and new. **C**

The Complete Book of Solitaire and Patience Games, by Albert Morehead and Geoffrey Mott-Smith (Grosset, 1953), 190pp. illus. 150 games explained; how to win at solitaire. **I, A**

Chess for Children, by Fred Reinfeld (Sterling, 1958), 61pp. illus. Each piece is described and the rules that govern its play stated. Moves and positions are shown by photos and diagrams. **C**

First Book of Chess, by I. A. Horowitz and Fred Reinfeld (Barnes, 1953), 126pp. Authors of *Chess Review* explain the basic points of the game. **I, A**

Magic and Magicians, by William Severn; illus. by Yukio Tashiro (McKay, 1958), 178pp. Directions for performing a few tricks, and stories about some of the great magicians. **C, I**

Scarne's Magic Tricks, by John Scarne (Crown, 1951), 256pp. 200 tricks that can be performed with such articles as handkerchiefs, coins, matches, paper, and pencils. **C, I, A**

Indian Games and Crafts, written and illus. by Robert Hofsinde (Gray-Wolf) (Morrow, 1957), 126pp. How to make simple equipment for 12 games and to play them just as the Indians did. **C**

Parties and Dancing (793)

Successful Entertaining at Home; A Complete Guide for Informal Entertaining, by Carolyn Coggins (Prentice, 1952), 383pp. illus. Ideas for holiday parties and family celebrations; games for all ages; shower and wedding plans; food and drink menus and recipes. **I, A**

Year-Round Party Book, by William P. Young and Horace J. Gardner; rev. by Lee Wyndham (Lippincott, 1957), 136pp. This ed. adds more plans for special occasions and new ideas for refreshments. **C, I, A**

Birthday Parties for Boys and Girls from One to Fourteen, by Mary G. Ellsworth (Woman's, 1951), 158pp. Suggestions and directions for entertainment, decorations, and menus, arranged by age group. **A**

Omnibus of Fun, by Helen and Larry Eisenberg; illus. by Ed. Goddard (Y.M.C.A., 1956), 625pp. illus. music. Games, stunts, and social activities of all kinds. **C, I, A**

Abingdon Shower Parade, by Bernice Hogan (Abingdon, 1957), 125pp. illus. Plans, games, and gift suggestions for wedding, baby, and other showers. **A**

The Dance in America, by Walter Terry (Harper, 1956), 248pp. illus. All periods and types of American dancing, with sketches of some famous dancers. **I, A**

Walk Your Way to Better Dancing, by Lawrence Hostetler; rev. ed. (Ronald, 1952), 295pp. illus. How to improve your dancing technique and add to your repertory of steps and combinations. **I, A**

Teen-Age Dance Book, by Betty White; illus. by Robert Burns (McKay, 1952), 240pp. Author is a teacher of social dancing in Westchester County, N.Y., public schools. Figure drawings and designs illustrate many dances. **C, I**

HISTORY, BIOGRAPHY, AND TRAVEL (900–999)

General, Ancient, and World War II (901, 940.5)

The Story of Civilization, by Will Durant (Simon, 1950–57), 6 vols. Vol. 1. *Our Oriental Heritage*. Ancient Egypt and the Near East to the death of Alexander; India, China, and Japan from the beginning to the present day. Vol. 2. *The Life of Greece*. From earliest times to the Roman conquest. Vol. 3. *Caesar and Christ*. From the beginning of Rome to the Dark Ages. Vol. 4. *The Age of Faith*. Medieval civilization from Constantine to Dante; Christian, Islamic, and Judaic life; chivalry; and the Crusades. Vol. 5. *The Renaissance*. Italy's Golden Age, from Petrarch to Titian. Vol. 6. *The Reformation*. Europe's religious conflicts, to Calvin. **A**

A Study of History, by Arnold J. Toynbee; abridged to 2 vols. by D. C. Somervell (Oxford, 1957), 617; 414pp. illus. Vol. 1 contains the abridgment of the first six volumes, and Vol. 2, of the last four volumes of the original study. **A**

Atlas of World History, ed. by R. R. Palmer (Rand, 1957), 216pp. Maps illustrating geographical, economic, cultural, and political aspects of world history from ancient times through World War II. **I, A**

World Since 1919, by Walter C. Langsam; 7th ed. of "World Since 1914" (Macmillan, 1954), 797pp. illus. maps. A survey of events and developments. This ed. omits chapters on World War I carried in earlier editions. **A**

Flags of the World, ed. by Harold G. Carr (Warne, 1956), 209pp. illus. Stories about 300 flags, each illus. in color. **C, I, A**

Battles That Changed History, by Fletcher Pratt (Hanover, 1956), 348pp. maps. From the defeat of Darius by Alexander the Great, to the siege of Vicksburg. **I**

Everyday Life in Ancient Times, ed. by The National Geographic Society; illus. by H. M. Hergot (The Society, 1951), 356pp. 120 col. plates, 90 photos. Articles by four archaeologists on Egypt, Mesopotamia, Greece, and Rome. **I, A**

The Second World War, by Winston S. Churchill (Houghton, 1948–53), 6 vols. maps. Vol. 1. *The Gathering Storm*, 784pp. Vol. 2. *Their Finest Hour*, 751pp. Vol. 3. *The Grand Alliance*, 903pp. Vol. 4. *The Hinge of Fate*, 1,000pp. Vol. 5. *Closing the Ring*, 749pp. Vol. 6. *Triumph and Tragedy*, 800pp. **I, A**

Nine Who Survived Hiroshima and Nagasaki, by Robert O. Trumbull (Dutton, 1957), 148pp. illus. The personal experiences of nine men who lived through the atomic bombings. **I, A**

United States

General

A History of American Civilization, by Merle Curti and others (Harper, 1953), 836pp. maps. The record of events and facts is woven into discussions of the trends in American political ideas, foreign policy, economics, and culture. **A**

The American Story; The Age of Exploration to the Age of the Atom, ed. by Earl S. Miers (Channel, 1956), 352pp. illus. photos. For this history each of 60 historians has written a chapter on his particular field of interest. **A**

The American Reader, by Paul M. Angle; illus. by Franz Altschuler (Rand, 1958), 703pp. A collection of personal opinions and accounts of events from journals, diaries, and newspapers, ranging from Columbus on his first voyage to an AP dispatch on the launching of the satellite Explorer. **I, A**

American Guide Series. Individual volumes for each state of the mid-continental U.S. and Alaska. Compiled under the auspices of the Federal Works Agency. Studies for tourists, vacationists, and sportsmen, with special information on the landmarks, roads, camps, and history of individual states. **I, A**

Life and Events

They Saw America First; Our First Explorers and What They Saw, by Katherine and John Bakeless (Lippincott, 1957), 222pp. illus. maps. **C, I**

The Americans, by Harold Coy; illus. by William Moyers (Little, 1958), 328pp. How Americans have lived, worked, and tackled new problems throughout their entire history. **C, I**

Story of the "Old Colony" of New Plymouth, by Samuel E. Morison; illus. by Charles H. Overly (Knopf, 1956), 206pp. History of Plymouth Colony from its beginnings in England to its union with Massachusetts Bay Colony in 1692. Describes the life of the settlers, their government, and their relations with the Indians. **C, I**

The War of the Revolution, by Christopher Ward; ed. by John R. Alden (Macmillan, 1952), 2 vols. 989pp. 60 maps. A detailed history of the military aspects of the American Revolution. **A**

The Story of the Declaration of Independence, by Dumas Malone; illus. by Hirst Milholen and Milton Kaplan (Oxford, 1954), 282pp. History of the Declaration, of its writers and signers, and of the situation that produced it. **C, I, A**

Cultural Life of the American Colonies, 1607–1763, by Louis B. Wright (Harper, 1957), 292pp. illus. A critical discussion of the commercial, intellectual, and recreational pursuits of the English American colonists, with a chapter on the non-English elements. **I, A**

Colonial Living, written and illus. by Edwin Tunis (World, 1957), 155pp. The clothes, houses, furniture, and other possessions of the American colonists. **C, I**

Golden Book of America; Stories from Our Country's Past, adapted by Irwin Shapiro from the magazine *American Heritage* (Simon, 1957), 216pp. illus. maps. A pictorial history that includes such items as sailing ships, country stores, and dime novels. **C**

Men to Match My Mountains; The Opening of the Far West, 1840–1900, by Irving Stone (Doubleday, 1956), 459pp. A history of the settlement of the present states of California, Nevada, Utah, and Colorado, told in terms of the people who shaped that history. **I, A**

This Hallowed Ground, by Bruce Catton (Doubleday, 1956), 437pp. A narrative history of the Civil War as seen from the Union side, but with conisderable sympathy for the Southern point of view. **I, A**

St. Lawrence Seaway, by Clara I. Judson (Follett, 1959), 160pp. illus. photos. The opening of the Great Lakes region. **I, A**

Indians

Indians, text and illus. by Edwin Tunis (World, 1959), 157pp., 250 drawings. A pictorial re-creation of the everyday life of the American Indians before the arrival of the white man. **C, I**

American Indians, comp. by Walter M. Daniels (Wilson, 1957), 219pp. A reference book containing 44 articles on various aspects of Indian life and Indian-white relations. **I, A**

Hokahey! American Indians Then and Now, by Edith Dorian and W. N. Wilson (McGraw, 1957), 112pp. illus. map. Tells of the Indians' probable origins, their migrations and culture. **C, I**

Pictorial History of the American Indian, by Oliver La Farge (Crown, 1956), 272pp. illus. maps. Covers great events and notable chiefs and heroes of Indian history since the arrival of the white man. Authentic illus. and photos. **C, I, A**

Horsemen of the Western Plateaus; the Nez Percé Indians, by Sonia Bleeker; illus. by Patricia Boodell (Morrow, 1957), 157pp. map. Describes the Indians and retells some of their legends. **C**

The Navajo; Herders, Weavers, and Silversmiths, by Sonia Bleeker; illus. by Patricia Boodell (Morrow, 1958), 159pp. map. Describes the lives of the Navajos on their reservation. **C**

Foreign

Fantastic South America, Continent of the Future, by Henry Lionel Williams (Horizon, 1958), 350pp. illus. A history of the continent from the days of the Conquistadors to the present, with descriptions of the people. **A**

Picture History of Canada, text and illus. by Clarke Hutton (Watts, 1956), 62pp. maps. **C**

Canadians in the Making; A Social History of Canada, by Arthur R. M. Lower (Longman's, 1958), 475pp. illus. Discusses the evolution of the Canadian habit of mind. **I, A**

Quest for Africa; Two Thousand Years of Exploration, by Heinrich Schiffers-Dawringhausen; trans. by Diana Pyke (Putnam, 1958), 352pp. illus. maps. A history told in terms of noted explorations. **I, A**

An African Survey; A Study of Problems Arising in Africa, South of the Sahara, by Malcolm Hailey, 1st Baron Hailey; issued under the auspices of the Royal Inst. of International Affairs (Oxford, 1957), 1,676pp. maps. Primarily a survey of colonial Africa; a standard reference work. **A**

Knights, Castles, and Feudal Life, by Walter Buehr (Putnam, 1957), 72pp. illus. Discusses the roles of the nobility, the abbey, and the peasants; the building of the castles, and the training of knights. **C, I**

Unity of European History, by John Bowle (Oxford, 1950), 383pp. An account of European civilization and history. **I, A**

Contemporary Europe Since 1870, by Carlton J. H. Hayes; rev. ed. (Macmillan, 1958), 835pp. illus. maps. This ed. adds three chapters on postwar developments in Europe. **A**

A History of the English-Speaking Peoples, by Winston S. Churchill (Dodd, 1956–58), 4 vols. maps. Vol. 1. *The Birth of Britain*, 521pp. Vol. 2. *The New World*, 433pp. Vol. 3. *The Age of Revolution*, 402pp. Vol. 4. *The Great Democracies*, 403pp. Index to each vol. **I, A**

Looking at History; Britain from Cavemen to the Present Day, by Robert J. Unstead (Macmillan, 1956), 355pp. Describes the everyday lives of ordinary people in England. **C**

History of France, by André Maurois; trans., Henry L. Binsse and Gerard Hopkins (Farrar, 1956), 560pp. illus. maps. France from the beginnings to the closing period of the Fourth Republic. **A**

Battle Against the Sea; How the Dutch Made Holland, by Patricia Lauber (Coward, 1956), 96pp. photos. Holland's continuing struggle to hold back the sea. **C, I**

Israel; New People in an Old Land, by Lily Edelman (Nelson, 1958), 208pp. illus. map. Describes Israel's mixture of peoples and cultures, and its domestic and international problems. **I**

Introducing Asia, by Lawrence H. Battistini (Day, 1953), 289pp. illus. maps. A brief survey of the land, resources, peoples, and present situations. The major part of the book deals with India, China, and Japan. **A**

Japan, ed. by Doré Ogrizek (McGraw, 1957), 400pp. col. illus. maps. Articles by a number of specialists on various phases of Japanese history and culture. **A**

Australian Explorers; a Selection from Their Writings with an Introduction, edited by Kathleen Elizabeth (Pitt) Fitzpatrick (Oxford, 1958), 503pp. maps. Accounts of the men who explored Australia since penetration of the interior was begun. **I, A**

Biography (920–929)

(For biographies of painters, see *Painting;* of musicians, see *Music.*)

Collective

The World's Most Daring Explorers, by Richard S. Lambert; illus. by Robert Kunz (Sterling, 1956), 168pp. The adventures of 38 explorers, from early Vikings to Hillary and Tenzing. **C, I**

Men of Power; A Book of Dictators, by Albert H. Z. Carr; illus. by Marc Simont; rev. ed. (Viking, 1956), 298pp. illus. Stories about great dictators, from Richelieu to Mao Tse-tung. **C, I**

Men Who Made the Nation, by John R. Dos Passos (Doubleday, 1957), 469pp. Stories about nine great men who influenced opinion and action in the U.S. in the critical years between Yorktown in 1781 and the Louisiana Purchase in 1803. **I, A**

Dreamers of the American Dream, by Stewart H. Holbrook (Doubleday, 1957), 369pp. Stories about reformers and visionaries who battled in such issues as slavery, temperance, woman suffrage, the handicapped and insane, taxation, and the labor movement. **I, A**

Great American Negroes, by Ben A. Richardson; rev. by William A. Fahey; illus. by Robert Hallock (Crowell, 1956), 339pp. This ed. adds 11 new biographies and omits six. Most of those covered are still living. **C, I**

Profiles in Courage, by John F. Kennedy (Harper, 1956), 266pp. The Senator from Massachusetts tells the stories of eight U.S. Senators, from Quincy Adams to Robert A. Taft, who stood by what they thought was right although it meant their political downfall. **C, I, A**

A Bridle for Pegasus, by Katherine B. Shippen; illus. by C. B. Falls (Viking, 1951), 192pp. Biographies of famous fliers, from the legendary Daedalus to Igor Sikorsky. **C, I**

Individual

George Washington, Frontier Colonel, by Sterling North; illus. by Bob Riger (Random, 1957), 184pp. maps. Washington as a boy, a young surveyor, and an officer in the French and Indian War. **C, I**

Abe Lincoln; Log Cabin to White House, by Sterling North; illus. by Lee Ames (Random, 1956), 184pp. illus. Deals mostly with his boyhood and youth. **C, I**

America's First Trained Nurse: Linda Richards, by Rachel Baker (Messner, 1959), 192pp. illus. Biography of the first graduate of the first American nursing school; tells of the reforms she made at New York's Bellevue Hospital, of her travels, and of her founding of a school of nursing in Japan. **C, I**

Cochise; Apache Warrior and Statesman, by Edgar Wyatt; illus. by Allan Houser (McGraw, 1953), 192pp. Biography of an Apache who won the love of his people and the respect of white men. The illustrator is an Apache. **C**

Frederick Douglass: Slave—Fighter—Freeman, by Arna W. Bontemps; illus. by Harper Johnson (Knopf, 1959), 177pp. Deals mainly with Douglass' youth, when he secretly taught himself to read, his brutal treatment by a "slave breaker," and his escape to the North. **C, I**

That Dunbar Boy; The Story of America's Famous Negro Poet, by Jean Gould; illus. by Charles Walker (Dodd, 1958), 245pp. A biography of Paul Lawrence Dunbar, one of the first professional Negro writers in the U.S. **C, I**

Louis Agassiz; Pied Piper of Science, by Aylesa Forsee; illus. by Winifred Lubell (Viking, 1958), 244pp. Story of the son of a poor Swiss pastor who became a great naturalist and writer in U.S. **C, I**

Playing for Life, by William F. Talbert with John Sharnik (Little, 1959), 310pp. illus. The story of a diabetic boy who became a tennis champion. **C, I**

I Always Wanted to Be Somebody, by Althea Gibson; ed. by Ed. Fitzgerald (Harper, 1958), 176pp. illus. The famous tennis champion tells of her childhood in Harlem, and of her struggle to reach the top in tennis. **I, A**

Antarctic Scout, by Richard L. Chappell (Dodd, 1959), 205pp. photos. An American Boy Scout's account of his experiences with the IGY scientists in the Antarctic. **C, I, A**

Galileo and the Magic Numbers, by Sidney Rosen; illus. by Harve Stein (Little, 1958), 212pp. The story of the 16th-century hero from his childhood through his struggles to gain acceptance of his discoveries in mathematics and astronomy. **C, I**

The South Sea Shilling; The Voyages of Captain Cook, by Eric Swenson; illus. by Charles M. Daugherty (Viking, 1952), 224pp. maps. An account of the career of the man who charted many of our navigation routes, including his unsuccessful search for a Northwest Passage. **C, I**

Apes, Angels, and Victorians; The Story of Darwin, Huxley, and Evolution, by William Irvine (McGraw, 1955), 399pp. illus. Draws parallel biographies of Darwin and Huxley, with a picture of their age, and a record of the growth of the theory of evolution. **I, A**

Florence Nightingale, 1820–1910, by Cecil B. Woodham Smith (McGraw, 1951), 382pp. illus. The career of the woman who brought sanitation and humanity to the standards of military nursing. **A**

Louis Pasteur; Free Lance of Science, by René J. Dubos (Little, 1950), 418pp. illus. Biography from the point of view of Pasteur's achievements; considers the steps of medical progress as they were made by Pasteur. **A**

The Gold of Troy; The Story of Heinrich Schliemann and the Buried Cities of Ancient Greece, by Robert Payne (Funk, 1958), 273pp. illus. Biography of the eccentric German financier and archaeologist. **I, A**

Anne Frank; A Portrait in Courage, by Ernest Schnabel; trans., Richard and Clara Winston (Harcourt, 1958), 192pp. illus. Selections from her short stories, and recollections from survivors who knew her. **I, A**

Tiger of the Snows, by Norgay Tenzing with James R. Ullman (Putnam, 1955), 249pp. illus. maps. The experiences of the Sherpa native, Tenzing, in climbing Mt. Everest with the British in 1953. Describes also the background of his people, and how their lives have been affected by the recent expeditions. **I, A**

Magsaysay Story, by Carlos P. Romulo and Marvin M. Gray (Day, 1956), 316pp. illus. The story of a poor village boy who became president of the Philippines. **I, A**

Nehru: A Political Biography, by Michael Brecher (Oxford, 1959), 680pp. illus. The background, education in England, political and psychological development of the leader of India. **I, A**

All Men Are Brothers; A Portrait of Albert Schweitzer, by Charlie M. Simon; photos by Erica Anderson (Dutton, 1956), 192pp. The background and main incidents of his life, showing how he arrived at his concepts of human service and universal brotherhood. **C, I, A**

Travel (910–919)

(For scientific exploration, see *Sciences: General.*)

General

Africa

Land and People of South Africa, by Alan Paton (Lippincott, 1955), 143pp. illus. map. The famous South African author describes his own country. **C**

Zanzabuku [*Dangerous Safari*], by Lewis Cotlow (Rinehart, 1956), 370pp. photos. Describes life—human and animal—as the author found it on three expeditions into Equatorial and East Africa. **I, A**

Getting to Know Liberia, by Albert Craz; illus. by Don Lambo (Coward, 1958) 64pp. map. Life in the country that was organized by Negroes from the U.S. **C**

Asia

Let's Visit Southeast Asia, Hong Kong to Malaya, by John C. Caldwell (Day, 1957), 96pp. illus. maps. Discusses the history, people, customs, and present significance of each country. **C, I**

Let's Read About China, by Cornelia Spencer, pseud. for Grace Yaukey; rev. ed. (Fideler, 1955), 128pp. illus. This ed. adds a chapter on the political changes since 1945. **C**

Seven Years in Tibet, by Heinrich Harrer (Dutton, 1954), 314pp. illus. maps. Experiences of an Austrian mountain climber in Lhasa from 1943 to 1950. **I, A**

Getting to Know Turkey, by Fanny Davis; illus. by Don Lambo (Coward, 1957). 64pp. illus. map. Story of the remarkable progress Turkey has made since it became a republic some 30 years ago. **C, I**

Land and People of the Philippines, by Josephine B. Vaughan (Lippincott, 1956), 118pp. illus. maps. The land, the history, and the government of the Islands; the lives of the leaders; the daily life of the people. **C, I**

Annapurna; First Conquest of an 8,000-Meter Peak, by Maurice Herzog; trans., N. Morin and Janet Smith (Dutton, 1953), 316pp. illus. photos. Day-by-day account of the French Himalayan expedition. **I, A**

Beyond the Reefs, by William Travis (Dutton, 1959), 221pp. col. plates, photos. Travels along the coral reefs in the Indian Ocean. **I, A**

Australia, New Zealand, and Pacific Islands

Let's Read About Australia, by Leila and Kilroy Harris (Fideler, 1955), 112pp. illus. maps. The geography and climate of the smallest continent, and how these affect the people who live there. **C**

I Travelled a Lonely Land, by Nina Pulliam (Bobbs-Merrill, 1955), 400pp. photos. A lively account of present-day Australia, with a brief sketch of the country's history from the point of view of an American. **I, A**

The Story of Australia, by A. G. L. Shaw (Roy, 1956), 308pp. photos. An introductory book, outlining the history of Australia, and giving an impression of Australian life, art, literature, and customs. **I, A**

The Story of New Zealand, by A. H. Reed (Roy, 1955), 335pp. photos. New Zealand's history, from its discovery, exploration, and colonization, through political independence, with much geographical information and Maori folklore, by a New Zealander and authority on the subject. **A**

Kon-Tiki; Across the Pacific by Raft, by Thor Heyerdahl; trans., F. H. Lyon (Rand, 1950), 304pp. illus. The trip made by six young scientists from Peru to the South Seas in a balsa-wood raft. **I, A**

Aku-Aku; The Secret of Easter Island, by Thor Heyerdahl (Rand, 1958), 384pp. col. photos, maps. Exploration of Easter Island, its huge statues, and the customs of its people. **I, A**

Europe

Fielding's Travel Guide to Europe, by Temple H. Fielding (Sloan, annual), 128pp. Concentrates on how to travel. **A**

Land and People of Belgium, by Dorothy Loder (Lippincott, 1957), 115pp. illus. map. Describes the two Belgian peoples—the Flemings and the Walloons—their cities, their industries, and their arts. **I, A**

In France, by Marguerite Clément (Viking, 1956), 151pp. illus. Description of Paris and the provinces of France, the schools, homes, festivities, and problems of the people. **C, I**

Land and People of Germany, by Raymond A. Wohlrabe and Werner Krusch (Lippincott, 1957), 118pp. illus. map. Germany of the past and present, the people, and their contributions to the world. **C, I**

Life in Europe; Germany, by Gerhart H. Seger (Fideler, 1955), 160pp. photos, maps. Describes present-day German life and customs. **C**

The Young Traveler in Greece, by Geoffrey Trease; illus. by Donald W. Lambo (Dutton, 1956), 192pp. photos. Describes life in modern Greece against its ancient background. **C, I**

My Village in Ireland, by Sonia and Tim Gidal (Pantheon, 1957), 76pp. illus. Describes the life and customs of a typical family and their neighbors living in a small town on the west coast of Ireland. **C**

Life in Europe; Italy, by George Kish (Fideler, 1957), 160pp. illus. maps. Discusses the subjects studied by children: climate, land, industry, etc. **C**

Life in Europe; The Netherlands, by W. de G. van Embden (Fideler, 1955), 160pp. illus. maps. The canals and the gardens of Holland, and the lives of the people. **C**

Life in Europe; Norway, by Vincent H. and Ruth M. Malmstrom (Fideler, 1955), 160pp. illus. maps. Photos and descriptions of the Norwegian landscape and something of the customs of the people. **C**

Inside Russia Today, by John Gunther (Harper, 1958), 550pp. map. A quick survey of Russian geography, government, foreign policies, science, education, and cultural activities. **I, A**

Life in Europe; Sweden, by Vincent H. and Ruth M. Malmstrom (Fideler, 1956), 160pp. photos, maps. More than 100 photos help to round out a picture of Sweden. **C**

Life in Europe; Switzerland, by George W. and Viola Hoffman (Fideler, 1955), 160pp. illus. maps. Describes the country's beautiful scenery and its freedom-loving people. **C**

My Village in Yugoslavia, by Sonia and Tim Gidal (Pantheon, 1957), 74pp. photos. Life in a small village; how the people work and how they play. **C**

North America

The Arctic Year, by Peter Freuchen and Finn Salomonsen (Putnam, 1958), 348pp. illus. Life in the Arctic described month by month. **I, A**

Arctic Tundra, by Delia Goetz; illus. by Louis Darling (Morrow, 1958), 62pp. map. Describes the weather of the tundras, and the plants, animals, and people who live there. **C**

Here is the Far North, by Evelyn S. Stefansson (Scribner, 1957), 154pp. photos, maps. The wife of the Arctic explorer describes the Arctic regions as they appear from an airplane, and again from the ground. **C, I**

United States

Look at the U.S.A., by the editors of *Look;* with regional introductions by Mary Ellen Chase and others (Houghton, 1955), 522pp. illus. Covers New England, the Southwest, New York City, the central Northeast, the Midwest, the South, the central Northwest, and the Far West. Describes the landscapes, resources, and people. **I, A**

Exploring Our National Parks and Monuments, by Devereux Butcher; 5th ed. (Houghton, 1954), 288pp. photos. A guide book, frequently rev. to bring it up to date. **I, A**

Life in America; The South, by Richard E. Banta; illus. by Janet Croninger (Fideler, 1955), 160pp. photos. Describes the land, history, and people of the southern states. **C**

Life in America; The West, by Dale L. Morgan; maps by Janet Croninger and others (Fideler, 1955), 160pp. illus. Photos, maps, and text describing the western states. **C**

Mississippi Calling, by Virginia L. Eifert; illus. by Manning Lee (Dodd, 1957), 255pp. The story of the Mississippi River, and of the people who camped or explored or lived along its shores. **C, I**

Towboat River, text and photos by Edwin and Louise Rosskam (Duell, 1948), 295pp. A picture record of the towboats and rivermen on the Mississippi and Ohio rivers. **C, I, A**

Alaska; The Land and the People, by Evelyn I. Butler and George A. Dale (Viking, 1958), 159pp. photos, maps. The authors worked for the U. S. Bureau of Indian Affairs in Alaska for 15 years. **C, I**

Islands of Hawaii, by Bradford Smith (Lippincott, 1957), 118pp. illus. maps. Describes the geography and the people, with some of their folklore. **C**

Let's Read About the Hawaiian Islands, by Erna Fergusson (Fideler, 1955), 128pp. illus. The people, customs, and industries of our newest state. **C**

American Guide Series. Individual volumes for each state of the mid-continental U.S. Compiled under the auspices of the Federal Works Agency. Studies for tourists, vacationists, and sportsmen, with special information on the landmarks, roads, camps, and history of individual states. **I, A**

West Indies and South America

First Book of the West Indies, by Langston Hughes; illus. by Robert Bruce (Watts, 1956), 62pp. maps. Words and pictures describing the islands and their people. **C**

New Found World, by Katherine B. Shippen; illus. by C. B. Falls (Viking, 1945), 262pp. The peoples and countries of Latin America, chiefly Mexico, Haiti, Brazil, Argentina, and Peru. **I**

Neighbors to the South, by Delia Goetz; rev. ed. (Harcourt, 1956), 179pp. photos. About South America. **C**

Jungle Journey, by Jo B. M. Waldeck; illus. by Kurt Wiese (Viking, 1946), 255pp. The story of a trip through British Guiana. **C, I**

LANGUAGE (400–499)

Includes communication and communication media

General

All About Language, by Mario Pei (Lippincott, 1954), 186pp. The origin of languages, their relation to each other, and related topics. **C, I**

The World's Chief Languages, by Mario Pei (Devin, 1946), 664pp. illus. Guide to the study of many modern languages. **I, A**

The Tree of Language, by Helene and Charlton Laird; illus. by Ervine Metzl (World, 1957), 233pp. The origin of language; the beginning of English; the making of an alphabet and English spelling. **C, I, A**

Our Language; the Story of the Words We Use, by Eloise Lambert (Lothrop, 1955), 181pp. The geography of English words, their history and use. **C, I**

The Romance of Writing; From Egyptian Hieroglyphics to Modern Letters, Numbers, and Signs, written and illus. by Keith G. Irwin (Viking, 1956), 160pp. Origins of written words and of musical, mathematical, and other symbols, giving historical reasons for many odd and apparently illogical signs. **I, A**

The 26 Letters, by Oscar Ogg (Crowell, 1948), 254pp. 275 illus. How man learned to convey ideas by means of symbols. **C, I, A**

NBC Handbook of Pronunciation, comp. by James F. Bender; 2d ed. (Crowell, 1955), 381pp. More than 15,000 hard-to-pronounce words, including names of persons and places, and common words often mispronounced. **I, A**

Dictionary of Contemporary American Usage, by Bergen and Cornelia Evans (Random, 1957), 567pp. Comments and recommendations on the use of words and idiomatic phrases. Authors protest the use of clichés. **I, A**

Dictionary of American Proverbs and Proverbial Phrases, 1820–1880, by Archer Taylor and Bartlett J. Whiting (Belknap, 1959), 418pp. Selected from the books of the period, chiefly those of the frontier humorists. **I, A**

Dictionary of American Family Names, by Elsdon C. Smith (Harper, 1956), xxxiv, 244pp. Contains 6,000 main entries; variants, such as Smythe, bring the total to 10,000. **I, A**

Indian Sign Language, written and illus. by Robert Hofsinde (Gray-Wolf) (Morrow, 1956), 96pp. Shows the gestures representing more than 500 words in Indian sign language, including such modern words as "record player" and "Technicolor." **C**

Indian Picture Writing, written and illus. by Robert Hofsinde (Gray-Wolf) (Morrow, 1959), 96pp. An introductory dictionary of Indian picture-writing symbols for use as a puzzle game; includes five letters written in Indian symbols. **C, I**

Names on the Land; A Historical Account of Place-Naming in the United States, by George R. Stewart; rev. ed. (Houghton, 1958), 511pp. illus. maps. History and tales of American place names, including Alaska, and the changes caused by changing foreign relations. **I, A**

Reading Improvement for Adults, by Paul D. Leedy (McGraw, 1956), 456pp. illus. Instruction on reading with greater speed and comprehension. **A**

Your Baby's Name, by Maxwell Nurnberg and Morris Rosenblum (World, 1951), 240pp. 2,000 names for girls and 2,000 names for boys. **A**

Communication

General

Human Use of Human Beings; Cybernetics and Society, by Norbert Wiener; rev. ed. (Houghton, 1954), 199pp. A discussion of communication and control in the present industrial age. **A**

The Hidden Persuaders, by Vance Packard (McKay, 1957), 275pp. The techniques and approaches used in making people think, vote, and buy according to the desires of the promoter. **A**

Are You Listening? by Ralph G. Nichols and Leonard A. Stevens (McGraw, 1957), 235pp. Stresses the importance of listening, and shows how better to understand the meaning of what is heard. **I, A**

Battle for the Mind; a Physiology of Conversion and Brainwashing, by William W. Sargant (Doubleday, 1957), 263pp. The techniques used by evangelists, psychoanalysts, and brainwashers. **A**

Brainstorming; the Dynamic New Way to Create Successful Ideas, by C. H. Clark (Doubleday, 1958), 262pp. The solving of problems by group proposals and discussion. **I, A**

Competitive Debate; Rules and Techniques, by George M. Musgrave; 3rd ed. (Wilson, 1957), 170pp. Major changes in this ed. include the recodification of the rules, expanded material on cross-examination, and a new chapter on administration. **I**

New Guide for Toastmasters and Speakers, comp. by Herbert V. Prochnow (Prentice, 1956), 450pp. A handbook combining practical tips on the art of public speaking with 2,000 anecdotes, quips, and quotations. **I, A**

First Book of Codes and Ciphers, by Samuel and Beryl Epstein; illus. by Lazlo Roth (Watts, 1956), 62pp. Codes which have been used through history, and codes which are used today; how to make codes and invisible ink. **C**

Cryptanalysis; A Study of Ciphers and Their Solutions, by Helen F. Gaines (Dover, 1956), 237pp. illus. The use of codes by governments and individuals; descriptions and analyses. **I, A**

Heels, Wheels, and Wire; the Story of Messages and Signals, by Frances Rogers and Alice Beard, with 68 drawings by Frances Rogers; rev. ed. (Lippincott, 1953), 265pp. The development of communication throughout the ages on land, sea, and air. **C, I**

Composition and Writing

A Manual of Style, Containing Typographical and Other Rules for Authors, Printers, and Publishers Recommended by the University of Chicago Press, Together with Specimens of Type; 11th ed. (Univ. of Chic., 1949), 522pp. **I, A**

Writer's Handbook, ed. by A. S. Burack; rev. ed. (The Writer, 1957), 651pp. Articles by several authors on various types of professional writing; lists of markets. **I, A**

New Way to Better English, by Rudolf F. Flesch (Harper, 1958), 177pp. Guide to making the best of every-day English. **I, A**

First Book of Letter Writing, by Helen Jacobson and Florence Mischel; illus. by Laszlo (Watts, 1957), 62pp. Explains why we write letters, how to compose the various kinds, and what kind of stationery to use for each. **C, I**

Preparing the Research Paper, by Robert M. Schmitz and John P. McDonald; 4th ed. (Rinehart, 1957), 74pp. illus. Suggestions on selecting a subject, using the library, gathering and organizing the materials, etc. **I**

Copy Capsules, by Hal Stebbins (McGraw, 1957), 223pp. On how to write advertising copy for various media. **I, A**

The Playwright's Art; Stage, Radio, Television, Motion Pictures, by Roger M. Busfield, Jr. (Harper, 1958), 260pp. Suggestions for the beginning writer on developing a dramatic instinct, and on the various phases of play construction and performance. **I, A**

Journalism (070)

Freedom of the Press, by William L. Chenery (Harcourt, 1955), 256pp. Traces the influence which the concept of a free press has had on American history. **I, A**

News in America, by Frank L. Mott (Harvard, 1952), 236pp. Explains how news is collected, how the wire services operate, and the activities in typical newspaper and radio newsrooms. **I, A**

Get That Story! Journalism, Its Lore and Thrills, by John J. Floherty (Lippincott, 1952), 150pp. Summary of the history, ideals, and methods of newspaper work; discussion of country newspapers as well as the big-city daily; news photography. **I, A**

The Pulitzer Prize Story, ed. by John Hohenberg (Columbia Univ., 1959), 375pp. illus. An anthology of news stories, editorials, cartoons, and photos from the Pulitzer Prize Collection, mostly from the past ten years, with introductions and notes by the editor. **I, A**

The Fourth Branch of Government, by Douglas Cater (Houghton, 1959), 194pp. The art and industry of newsgathering in Washington. **A**

Editing Small Newspapers; a Basic Handbook for Journalists, by Walter Rae; rev. ed. (Mill, 1952), 213pp. illus. Covers the high-school paper as well as the small-town weekly. **I, A**

Magazines in the United States, by James P. Wood; 2d ed. (Ronald, 1956), 390pp. illus. The role of magazines in reflecting and molding American tastes, habits, manners, and political and social opinions. **I, A**

How to Cover, Write, and Edit Sports, by H. E. Heath and Lou Gelfand (Iowa State College, 1951), 527pp. illus. photos. For newspapers, radio, and TV. **I, A**

Journalism and the Student Publication, by Frederick W. Maguire and Richard M. Spong (Harper, 1951), 431pp. illus. A guide for the publication of the student newspaper and yearbook. **I**

Radio and Television

(For Radio and TV engineering, see *Electronics.*)

Handbook of Broadcasting; The Fundamentals of Radio and Television, by Waldo Abbot and Richard Rider; 4th ed. (McGraw, 1957), 531pp. 98 illus. Information on the technology of radio and TV, and guides on the writing and direction of programs, and on speaking. **I, A**

Art of Television, by Jan Bussell (London, Faber, 1952), 164pp. Description for the TV audience of the work of a TV studio: script writing, production, use of music and ballet; includes the working script of a TV play, and describes the making of a news telecast. **I, A**

Television Story, by John J. Floherty; rev. ed. (Lippincott, 1957), 160pp. 32 photos. This ed. includes material on color TV and on producing TV programs. **C, I**

Television Advertising, by Clark M. Agnew and Neil O'Brien (McGraw, 1958), 300pp. illus. Detailed methods for preparing various types of TV advertising. **I, A**

Television Writing and Selling, by Edward B. Roberts; 2d ed. (The Writer, 1957), 504pp. photos. Author is manager of CBS Story Department. Book outlines the development of a TV story from idea to production. Includes complete scripts of various lengths for live and film production. **A**

LITERATURE (810–899)

General

Cassell's Encyclopedia of World Literature, ed. by S. H. Steinberg (Funk, 1953), 2 vols. 2,086pp. Vol. 1 contains (a) histories of the literatures of the world from oral traditions and first recordings, including today's primitive peoples; (b) articles on literary forms, schools, etc. Vol. 2 contains (a) biographies to 1914; (b) biographies since 1914. **I, A**

The Illustrated Treasury of Children's Literature, ed. by Margaret E. Martignoni; comp. with original illus. under the direction of P. Edward Ernest (Grosset, 1955), 512pp. Stories and poems from Aesop and Mother Goose to Phyllis McGinley and Dr. Seuss. **C**

This Way, Delight; A Book of Poetry for the Young, ed. by Sir Herbert E. Read; illus. by Juliet Kepes (Pantheon, 1956), 155pp. Poems chiefly from well-known poets, but including some by children and some by modern poets. **C**

Story Poems, Old and New, ed. by William Cole; illus. by Walter Buehr (World, 1957), 255pp. Nearly 100 poems from four centuries, all of which tell a good story. **C, I**

Little Laughter, comp. by Katherine I. Love; illus. by Walter H. Lorraine (Crowell, 1957), 114pp. Humorous verses and rhymes, selected by a children's librarian. **C**

Favorite Poems, Old and New, ed. by Helen J. Ferris; illus. by Leonard Weisgard (Doubleday, 1957), 598pp. More than 700 poems divided into 18 sections related to children's interests. **C**

A Treasury of the Theatre, ed. by John Gassner; rev. ed. (Simon, 1951), 3 vols. Vol. 1. *World Drama from Aeschylus to Turgenev*, 716pp. Vol. 2. *Modern European Drama from Henrik Ibsen to Jean-Paul Sartre*, 506pp. Vol. 3. *Modern British and American Drama from Oscar Wilde to Arthur Miller*. With introductions and biographical notes. **I, A**

English and American (810–829)

Poems; An Anthology for the Modern Reader, by Geoffrey Chaucer; ed. by E. T. Donaldson (Ronald, 1958), 1,001pp. Spelling has been modernized and obscure words are defined at the bottom of each page. **I, A**

Stewards of Excellence; Studies in Modern English and American Poets, by Alfred Alvarez (Scribner, 1958), 191pp. A comparison of the English poets Yeats, Auden, Empson, and Lawrence with the Americans Eliot, Pound, Hart Crane, and Wallace Stevens. **I, A**

Cavalcade of the North, ed. by George E. Nelson (Doubleday, 1958), 640pp. An anthology from the writings of 25 Canadians. **I, A**

Treasury of American Folk Humor, ed. by James N. Tidwell (Crown, 1956), xx, 620pp. Contains 350 selections from American folklore and humorists. **C, I, A**

Homespun America, ed. with introductions and commentaries by Wallace Brockway and Bart K. Winer (Simon, 1958), 831pp. Selections of prose and poetry from the late 18th century to the present, emphasizing humor and common sense. **I, A**

Criterion Book of Modern American Verse, ed. by Wystan H. Auden (Criterion, 1956), 336pp. Selections from 81 poets of the late 19th and 20th centuries. **I, A**

All the Happy Endings, by Helen Papashvily (Harper, 1956), 231pp. Subtitle: A Study of the Domestic Novel in America, the Women Who Wrote It, the Women Who Read It, in the Nineteenth Century. **I, A**

Radical Novel in the United States, 1900–1954; Some Interrelations of Literature and Society, by Walter B. Rideout (Harvard, 1956), 339pp. **I, A**

Best American Plays, ed. by John Gassner (Crown, 1958), 648pp. Text of 17 plays. Ed. reviews period and relates the playwrights and their plays to the history and environment of the time. **I, A**

Best Short Plays, 20th Century Edition, 1957, ed. by Margaret Mayorga (Beacon, 1957), 448pp. illus. music. Text of 18 one-act plays by American authors. **I, A**

Critics' Choice; New York Critics' Circle Prize Plays, 1935–55, ed. by Jack Gaver (Hawthorn, 1955), 661pp. The complete texts of 16 plays, with information as to casts and productions. **I, A**

Non-English (830–899)

Prose and Poetry of the Continental Renaissance in Translation, ed. by Harold Blanchard; 2d ed. (Longmans, 1955), 1,084pp. Selections from standard translations of Italian, French, and Spanish writers, with biographical notes and comments. **A**

Twenty Best European Plays on the American Stage, ed. by John Gassner (Crown, 1957), 733pp. **I, A**

Introduction to Scandinavian Literature from the Earliest Times to Our Day, by Elias Bredsdorff and others (Cambridge, 1951), 245pp. Emphasis is on the 19th and 20th centuries and their writers. **A**

Modern Scandinavian Plays: August Strindberg, Kaj Munk, Tryggvi Sveinbjörnson, Trygve Keill (Amer.-Scand. Found., 1954), 366pp. One play each from the Swedish, Danish, Icelandic, and Norwegian, in English translation. **A**

History of Italian Literature, by Ernest H. Wilkins (Harvard, 1954), 523pp. The progress of Italian literature from the 13th century to the present, with stress on writers before 1800. Social and political backgrounds are noted, and the interaction between English and Italian literature. **A**

A History of French Literature, by L. Cazamian (Oxford, 1955), 464pp. From the 9th century to the mid-20th. **A**

Twentieth-Century German Verse, ed. and trans., Herman Salinger (Princeton, 1952), 93pp. Contains 40 poems, with the German text and the English translation on facing pages. **I, A**

An Anthology of Spanish Literature in English Translation, ed. by Seymour Resnick and Jeanne Pasmantier (Ungar, 1958), 2 vols. 608pp. Vol. 1. *The Medieval Period; The Renaissance; The Golden Age*. Vol. 2. *18th century; 19th century; 20th century*. A few Spanish-American selections. **A**

A Golden Treasury of Jewish Literature, selected and edited by Leo W. Schwarz; illus. by Lionel S. Reis (Rinehart, 1937), 818pp. Selections in English from the 12th century B.C. to the present, arranged topically and by type—drama, poetry, religion, humor, travel. **I, A**

Echo of Greece, by Edith Hamilton (Norton, 1957), 224pp. An interpretation of Greek life and literature in the period just following the Periclean Age. **I, A**

Russian Writers; Their Lives and Literature, by Janko Lavrin (Van Nostrand, 1954), 363pp. Emphasis is on 19th-century writers; includes a chapter on "A Pattern of the Soviet Novel." Generous quotations. **A**

A Treasury of Asian Literature, ed. by John D. Yohannan (Day, 1956), 487pp. Selections, with introductions and commentaries, from the Arabic, Persian, Indian, Chinese, and Japanese by various translators. **A**

Modern Japanese Literature, ed. by Donald Keene (Grove, 1956), 440pp. An anthology of prose, poetry, and drama from 1870 to 1950. **I, A**

One Hundred Poems from the Chinese, trans., Kenneth Rexroth (New Directions, 1956), 159pp. Selections from nine poets who lived centuries ago. **I, A**

PHILOSOPHY (100–129, 140–149, 160–199)

Includes ethics, logic, personal conduct

General (100–129, 140–149)

History of Philosophy, by Frank Thilly; 3rd ed. rev. by Ledger Wood (Holt, 1957), 678pp. A study of philosophical theories in relation to one another and to the time when they were produced. New material on contemporary philosophies has been added to this revision. **A**

Great Ages of Western Philosophy (Houghton, 1955–57), 6 vols. Vol. 1. *Age of Belief; The Medieval Philosophers,* selected, with introduction and interpretive commentary by Anne Freemantle; 218pp. Vol. 2. *Age of Adventure; The Renaissance Philosophers,* selected . . . by Giorgio de Santillano; 283pp. Vol. 3. *Age of Reason; The 17th Century Philosophers,* selected . . . by Stuart Hampshire; 186pp. Vol. 4. *Age of Enlightenment; The 18th Century Philosophers,* selected . . . by Sir Isaiah Berlin; 282pp. Vol. 5. *Age of Ideology; The 19th Century Philosophers,* selected . . . by H. D. Aiken; 283pp. Vol. 6. *Age of Analysis; The 20th Century Philosophers,* selected . . . by Morton G. White; 253pp. **I, A**

This Is My Philosophy . . ., ed. by Whit Burnett (Harper, 1957), 378pp. Subtitle: Twenty of the World's Outstanding Thinkers Reveal the Deepest Meanings They Have Found in Life. **A**

The Spirit of Philosophy, by Marcus Long (Norton, 1953), 306pp. Explains the main channels of philosophy, and shows how curiosity about everyday life can lead to independent thinking about human destiny. **A**

The House of Intellect, by Jacques Barzun (Harper, 1959), 276pp. How the intellectual virtues in America are corrupted by anti-intellectual emphasis in art, science, education, and philanthropy. **A**

The Lonely Crowd; a Study of Changing American Character, by David Riesman and others; abr. by the authors (Garden City, 1953), 359pp. Discusses the process of social-character formation in large cities, correlating it with the major changes in population and technology. **A**

Individualism Reconsidered, and Other Essays, by David Riesman (Free Press, 1954), 529pp. Essays in defense of individualism, and on the need to develop people who thrive on freedom rather than on conformity to utopianism and totalitarianism. **A**

The Mind Goes Forth; the Drama of Understanding, by Harry and Bonaro Overstreet (Norton, 1956), 384pp. Deals with the problem of overcoming the hostilities that separate man from man. **I, A**

The Existentialists; a Critical Study, by James D. Collins (Regnery, 1952), 268pp. An analysis of the work of Sartre, Jaspers, Marcel, and Heidegger, from a Thomistic point of view. **A**

Chinese Thought from Confucius to Mao Tse-Tung, by Herrlee G. Creel (Univ. of Chicago, 1953), 292pp. A nontechnical history, especially devoted to the period just prior to the Christian era. **A**

Ethics (170–172)

Ethics, by Radoslav A. Tsanof; rev. ed. (Harper, 1955), 430pp. An outline of the moral philosophies, and a survey of the principal ethical problems. This ed. adds a chapter, "Skeptical Challenge to Systematic Ethics." **A**

Encyclopedia of Morals, ed. by Vergilius T. Ferm (Philosophical Lib., 1956), 682pp. Besides definitions, contains articles by 50 scholars on theories of behavior and ethics held by philosophers and by primitive peoples. **A**

Morals since 1900, by Gerald Heard (Harper, 1950), 223pp. An analytical history of the changes in moral ideas that have taken place in England and America in 50 years. **I, A**

Ethics in Government, by Paul H. Douglas (Harvard, 1952), 114pp. Sen. Douglas suggests elimination of subsidies to individuals and firms, and restrictions on campaign spending. **I, A**

The Rebel, by Albert Camus, with a foreword by Sir Herbert Read; trans., Anthony Bower (Knopf, 1954), 273pp. Describes how the theories of philosophers have been used with disastrous effect by political leaders. **A**

A Fair World for All; The Meaning of the Declaration of Human Rights, by Dorothy Canfield Fisher; foreword by Eleanor Roosevelt; illus. by Jeanne Bendick (McGraw, 1952), 159pp. **C, I**

Nature of Prejudice, by Gordon W. Allport (Beacon, 1954), 537pp. An account of what is known about the roots of hostility, differences among ethnic groups, and the operation of prejudice. **A**

What's Right with Race Relations, by Harriet H. Dexter (Harper, 1959), 284pp. The history and present condition of Negro-white relations, with emphasis on the progress that has been made. **I, A**

Logic (160–169)

Principles of Reasoning; An Introduction to Logic and Scientific Method, by Daniel S. Robinson; 3rd ed. (Appleton, 1947), 410pp. A college textbook. This ed. uses current situations and events in its exercises, revises the section on Probability, and adds a chapter, "Logical Significance of Radar Pips." **A**

How Man Thinks, by Richard Hope (Univ. of Pittsburgh, 1949), 479pp. An introductory text considering the basic principles of logic, with grouped exercises in the back. **A**

Art of Problem Solving; How to Improve Your Methods, by Edward Hodnett (Harper, 1955), 202pp. Author maintains that anyone can develop the skills necessary to use common logical procedures to solve everyday problems. **I, A**

Guides to Straight Thinking; With 13 Common Fallacies, by Stuart Chase (Harper, 1956), 212pp. Explains the principles of logic and identifies the major classes of fallacies that pass for logic but produce confusion and dissension. **I, A**

How to Develop Your Thinking Ability, by Kenneth S. Keyes, Jr.; cartoons by Ted Key (McGraw, 1950), 246pp. How to achieve sound thinking on personal and larger problems. **I, A**

Personal Conduct (173–178)

Art of Human Relations, by Henry C. Lindgren (Hermitage, 1953), 287pp. On getting along with ourselves and others; family and job relations discussed, with many examples. **I, A**

Ways to Improve Your Personality, by Virginia Bailard and Ruth M. Strang (McGraw, 1951), 249pp. illus. bibliog. Discusses problems common in adolescence; stresses popularity; uses case histories to illustrate specific situations. **C, I**

A Girl Grows Up, by Ruth Fedder; 3rd ed. (McGraw, 1957), 310pp. illus. bibliog. Deals with problems of personality and social adjustment. **I**

A Boy Grows Up, by Harry C. McKown and Marion LeBron; 2d ed. (McGraw, 1949), 333pp. Advice to the teen-aged boy on making his personal adjustments on an adult basis. **I**

Your Dating Days; Looking Forward to a Happy Marriage, by Paul H. Landis (McGraw, 1954), 155pp. illus. Discusses personal problems of teen-agers, emphasizing the family unit and attitudes that lead to happiness in marriage. **I**

How to Live With Your Teen-Ager, by Dorothy Baruch (McGraw, 1953), 261pp. Methods of supplying the teen-ager's need for information, and maintaining a balance between authority and independence. **A**

The Better Half of Your Life; How to Live in Health and Happiness from Forty to Ninety, by Charles H. Lerrigo (Day, 1951), 270pp. Emphasizes the importance of hobbies and gives specific advice on getting along with in-laws. **A**

Retirement Handbook; a Complete Planning Guide for Your Future, by Joseph C. Buckley (Harper, 1956), 329pp. Answers to questions of how much you will need; where to live; what to do. **A**

Drinking, and What to Do About It, by William A. DeWitt (Grosset, 1952), 186pp. For nondrinkers, social drinkers, and chronic alcoholics. **A**

How to Help an Alcoholic, by Clifford J. Earle (Westminster, 1952), 96pp. Religion as an aid to recovery. **A**

RELIGION (200–299)

General

Holy Bible, Containing the Old and New Testaments; Translated out of the Original Tongues; and with the Former Translations Diligently Compared and Revised by King James's Special Command, 1611 (Oxford and others). This is the King James Version.

The Holy Bible . . . The Douay Version of the Old Testament, . . . The Confraternity Edition of the New Testament . . . (Kenedy, 1950), 1,086+359pp. col. plates, maps, chronological tables. This is the Catholic Bible.

The Holy Scriptures According to the Masoretic Text; A New Translation with the Aid of Previous Versions, and with Constant Consultation with Jewish Authorities (Jewish Publ. Soc., 1955), 2,264pp. The same books contained in the Protestant Old Testament but arranged in different order.

Harper's Dictionary of the Bible by Madeleine S. Miller and J. Lane Miller (Harper, 1958), 850pp. illus. maps. Includes bibliographical references.

Tree of Life; Selections from the Literature of the World's Religions, ed. by Ruth Smith; illus. by Boris Artzybasheff (Viking, 1942), 496pp. A group of 13 selections, from legends and chants of American Indians through the complex books of the Hindus. **I, A**

World Religions . . ., by Benson Y. Landis (Dutton, 1957), 158pp. glossary. Subtitle: A Brief Guide to the Principal Beliefs and Teachings of the Religions of the World, and to the Statistics of Organized Religion. **I, A**

How the Great Religions Began, by Joseph Gaer; rev. ed. (Dodd, 1956), 424pp. History of 11 living religions. **I, A**

Creeds in Competition; A Creative Force in American Culture, by Leo Pfeffer (Harper, 1958), 176pp. Author develops the premise that controversy over the many points of church-state relationship increases cultural values in the U.S. **A**

Guide to the Religions of America . . ., ed. by Leo Rosten (Simon, 1955), 282pp. Written for *Look* magazine by leading members of the faiths under discussion; there are also remarks on agnosticism, scientific credos and beliefs of nonchurchgoers. **I, A**

In God We Trust; The Religious Beliefs and Ideas of the American Founding Fathers, ed. by Norman Cousins (Harper, 1958), 464pp. Selections from diaries, letters, and official papers of nine of the leaders in establishing the U.S. **I, A**

Cave of Riches; the Story of the Dead Sea Scrolls, by Alan Honour; illus. by P. A. Hutchison (McGraw, 1956), 159pp. A seminarrative account which reconstructs the drama of the Dead Sea Scrolls since their discovery in 1947. **C, I**

Dead Sea Scrolls, by Millar Burrows, with trans. by the author (Viking, 1955), 435pp. illus. map. Detailed description of the discoveries; full account of each of the conflicting opinions. **A**

Christian (220–289)

Layman's Guide to Protestant Theology, by William Hordern (Macmillan, 1955), 222pp. The author, professor of religion at Swarthmore, traces the growth of orthodox forms of Christianity from the 16th century to modern times. **I, A**

Christian Thought and Action; The Role of Catholicism in Our Time, by Aelred Graham (Harcourt, 1958), 241pp. 16 essays on spiritual and theological questions by the prior of a Benedictine community. **A**

Christian Ethics, by G. E. Harkness (Abingdon, 1957), 240pp. The Biblical foundation of Christian ethics, and its application to such present-day problems as race relations, war and peace, economic life, and culture. **C, I, A**

The Ancestry of Our English Bible, by Ira M. Price; rev. by William A. Irwin and Allen P. Wikgren (Harper, 1949), 353pp. Discusses the various texts and versions, and also the times that gave rise to each of them. **I, A**

The Twelve; the Story of Christ's Apostles, by Edgar J. Goodspeed (Winston, 1957), 182pp. The apostles considered separately and as a group; their early spreading of the gospel. **I, A**

Biblical Archaeology, by George E. Wright (Westminster, 1957), 288pp. illus. maps. A summary of archaeological discoveries that directly illumine Biblical history. **A**

How To Work With Church Groups, by Mary A. Douty (Abingdon, 1957), 170pp. How to form a group; the art of discussion; the uses of drama. **I, A**

Judaism (296)

Between God and Man; an Interpretation of Judaism, by Abraham J. Heschel; ed. and introduced by Fritz A. Rothschild (Harper, 1959), 279pp. A one-volume selection and systematic arrangement of Heschel's writings. **A**

Understanding Judaism, by Daniel L. Davis (Philosophical Lib., 1958), 119pp. Directed chiefly to the non-Jewish reader. **I, A**

Understanding the Old Testament, by Berhard W. Anderson (Prentice, 1957), 551pp. illus. maps, bibliog. The Old Testament in its context of culture, politics, and geography; what the writers were saying to their times. **I, A**

The Wisdom of the Torah, ed. by Dagobert D. Runes (Philosophical Lib., 1956), 300pp. Selections from the philosophical and poetical writings of ancient Israel. **C, I, A**

The Course of Modern Jewish History, by Howard M. Sachar (World, 1958), 617pp. From the French Revolution to the present State of Israel, covering the emancipation from the ghetto with the rise of capitalism, and the emergence of anti-Semitism with modern totalitarianism. **I, A**

Man, Morals, and History; Today's Legacy from Ancient Times and Biblical Peoples, by Chester C. McCown (Harper, 1958), 350pp. illus. The contribution of the Hebrews to the morals, culture, and religion of Western civilization. **I, A**

Everyday Life in Old Testament Times, by E. W. Heaton; illus. by Marjorie Quennell (Scribner, 1956), 240pp. The day-to-day lives of the people of Israel between 1250 and 586 B.C. **I**

Adventure in Freedom; 300 Years of Jewish Life in America, by Oscar Handlin (McGraw, 1954), 282pp. illus. bibliog. glossary. The story of the Jewish immigrants to the U.S., where they came from and why, and what freedom they found here. **I, A**

Others (297)

The Philosophy of Buddha, by A. J. Bahm (Harper, 1958), 175pp. An analysis of what the founder of Buddhism said according to the earliest scriptures. **I, A**

Allah, the God of Islam; Moslem Life and Worship, by Florence M. Fitch (Lothrop, 1950), 144pp. photos. How the Moslems live; what they think and believe. **I, A**

SCIENCES
(150–159, 300–399, 500–599, 610–619)

Includes basic sciences, biological sciences, medical sciences, psychology, and social sciences

General

Includes scientific exploration

Science and Its Background, by H. D. Anthony; 2d ed. (Macmillan, 1954), 337pp. illus. The relation of science to history, from primitive Mesopotamia to the world today; concluding with notes on the modern utilization of science, science for its own sake, and man's place in nature. **A**

The World of Science, by Jane W. Watson (Simon, 1958), 216pp. col. photos, diagr. Chapters on each of the major science topics; mathematics, astronomy, physics, chemistry, engineering, geology, and biology. **C, I**

Science for the Citizen; a Self-Educator Based on the Social Background of Scientific Discovery, by Lancelot T. Hogben; illus. by J. F. Horrabin; new ed. (Norton, 1957), 1,162pp. maps. This ed. contains a new chapter on "Atomic Energy in the Service of Mankind." **I, A**

Exploring Nature With Your Child. . ., by Dorothy E. Shuttlesworth (Greystone, 1952), 448pp. illus. Descriptions of wild and domestic birds and animals, wild and cultivated flowers; has a chapter on stars, and one on weather. **C, A**

Below the Surface, comp. by Alice J. Hazeltine (Abingdon, 1958), 223pp. illus. Selections from books and magazine articles written by explorers of caves, mines, tunnels, and ocean beds. **C, I, A**

Diving for Science, by Lynn Poole; illus. by Jeanne Bendick (McGraw, 1955), 160pp. Underwater scientific research and its contribution to knowledge about the earth. **C**

Silent World, by Jacques-Ives Cousteau and Frederic Dumas (Harper, 1953), 266pp. col. plates. Undersea salvage and scientific research and exploration in the Mediterranean, told by the inventors of the aqualung. **I, A**

Ice Island; The Story of Antarctica, by R. Frank, Jr. [pseud. for Frank X. Ross] (Crowell, 1957), 218pp. photos, maps. The adventures of the explorers; answers the question why man wants to explore Antarctica. **C, I**

Operation Deepfreeze, by George J. Dufek (Harcourt, 1957), 243pp. illus. maps. The commander of the U.S. Naval Support Force in the Antarctic reports on the building of bases in Antarctica early in 1956. **I, A**

Seven Caves; Archaeological Explorations in the Middle East, by Carleton S. Coon (Knopf, 1957), xx, 338pp. illus. maps. The discovery and excavation of caves where relics of prehistoric man were found. **I, A**

Lost Cities, by Leonard Cottrell (Rinehart, 1957), 251pp. 24 plates. The search for Nineveh, Ur, and other once-great cities which have been discovered by scholar-adventurers. **I, A**

Research Ideas for Young Scientists, by George Barr; illus. by John Teppich (McGraw, 1958), 142pp. Math-science research projects in the areas of electricity, sound, transportation, and others. **C, I**

Basic Sciences (500–559)

Includes astronomy, chemistry, earth sciences, mathematics, and physics

Astronomy (520–529)

Includes maps and map making

Dictionary of Astronomy and Astronautics, by Armand Spitz and Frank Gaynor (Philosophical Lib., 1959), 439pp. illus. graphs. **A**

Suns, Myths, and Men, by Patrick A. Moore (London, Muller, 1954), 192pp. A history of astronomy. **I, A**

American Merchant Seaman's Manual. . ., ed. by Felix M. Cornell and Allan C. Hoffman; 5th ed. (Cornell Maritime, 1957), xxv, 834pp. illus. Nautical astronomy. **I, A**

Exploring the Universe, by Roy A. Gallant; illus. by Lowell Hess (Garden City, 1956), 62pp. col. illus. maps. From the discoveries of early astronomers to present-day concepts of the universe. **C**

Looking at the Stars, by Michael W. Ovenden (Philosophical Lib., 1958), 192pp. illus. Nebulae, star clusters, sunspots, telescopes, and rockets. **C, I**

Adventure in Astronomy, by Kenneth Heuer (Viking, 1958), 127pp. illus. maps. Describes the sky on Midsummer Eve as it appears from different places on the earth. **I**

Comets, by Herbert S. Zim; illus. by Gustav Schrotter (Morrow, 1957), 64pp. maps. All the known facts about the comets are discussed and current speculation about them is considered. **C, I**

The Nine Planets, by Franklyn M. Branley (Crowell, 1958), 77pp. illus. The size, position, composition, motions, etc., of planets, described for amateurs. **I, A**

Introducing the Constellations, by Robert H. Baker; rev. ed. (Viking, 1957), 209pp. 30 plates. Descriptive astronomy for beginners, presenting the various constellations, ways of identifying them, and stories and legends about them. **I, A**

Space Book for Young People, by Homer E. Newell, Jr.; illus. by Anne Marie Jauss (McGraw, 1958), 114pp. Discusses the position of the earth in the universe, the moon and artificial satellites, the sun and other planets, and the possibilities of space travel. **I**

Seven Days from Sunday, by Tom Galt; illus. by Don Freeman (Crowell, 1956), 215pp. The development of the present system of days and weeks, including northern and eastern myths. List of names of days in many languages. **C, I**

Story of the Jewish Calendar, by Azriel L. Eisenberg; illus. by Elizabeth Friedlander (Abelard, 1958), 62pp. Describes the manner in which early rabbis determined the beginning of weeks, months, and festivals; the improvements that came with greater mathematical knowledge, and the relation of this to the Gregorian calendar. **C, I, A**

Understanding Maps; Charting the Land, Sea and Sky, by Beulah Tannenbaum and Myra Stillman; illus. by Rus Anderson (McGraw, 1957), 144pp. maps. All types of maps and how they are made. **C**

Down to Earth; Mapping for Everybody, by David Greenhood (Holiday, 1951), 262pp. illus. maps. Written to give user, maker, and collector an understanding and appreciation of maps. **I, A**

Chemistry (540–548)

Building Blocks of the Universe, by Isaac Asimov (Abelard, 1957), 256pp. illus. A discussion of the 101 known chemical elements. **I, A**

Chemistry in the Service of Man, by Alexander Findlay; 8th ed. (Longmans, 1957), 326pp. illus. The accomplishments of chemistry in raising the health and welfare of mankind. **I, A**

Discovering Chemistry, by Elizabeth K. Cooper (Harcourt, 1959), 190pp. illus. Introduction to the chemical elements and the structure of the atom and molecule; many simple experiments to illustrate basic principles. **C, I**

Chemistry Magic, by Kenneth M. Swezey (McGraw, 1956), 190pp. illus. How to set up a home laboratory; instructions for nearly 200 experiments; specific instructions on safety. **C, I, A**

Earth Sciences (550–559) General

Biography of the Earth, by George Gamow (Viking, 1948), 242pp. illus. The evolution and organization of the earth. **I, A**

The Earth We Live On; the Story of Geological Discovery, by Ruth E. Moore; drawings by Sue Allen (Knopf, 1956), 416pp. maps. Geology presented through the stories of scholars and field workers from earliest times to the present. **C, I, A**

Story of the Ice Age, by Rose Wyler and Gerald Ames; illus. by Thomas W. Voter (Harper, 1956), 81pp. Describes the various ice ages, with theories as to how they came about, and the tundras that border the ice fields. **C**

America Before Man, by Elizabeth C. Baity; illus. by C. B. Falls (Viking, 1953), 224pp. The geological development of the American continent, and the progression of life from the appearance of one-celled animals to the rise of mammals. **I**

Exploring Earth and Space; the Story of the I. G. Y., by Margaret O. Hyde; illus. by Clifford N. Geary (McGraw, 1957), 160pp. maps. The aims of scientists during the International Geophysical Year. **C**

Caves, Rivers, Rocks, Sea, Volcanoes, Earthquakes, and Weather

Story of Caves, by Dorothy Sterling; illus. by Winifred Lubel (Doubleday, 1956) 121pp. The kinds of caves; how they are formed; the plants and animals that live in them; list of American caves open to the public. **C**

Exploring Caves, by Polly Longsworth; illus. by Gustav Schrotter (Crowell, 1959), 175pp. Tells of the kinds of caves and how they are formed; gives directions and cautions for amateur cave explorers; describes some famous caves. **C, I**

All About Great Rivers of the World, by Anne T. White; illus. by Kurt Wiese (Random, 1957), 150pp. maps. Explanation of rivers in general, followed by descriptions of the five greatest. **C**

The Rock-Hunter's Field Manual; a Guide to Identification of Rocks and Minerals, by D. K. Fritzen; illus. by Lon Fox (Harper, 1959), 207pp. 126 common and rare minerals described, with notes on their localities and uses. **I, A**

The Sea and its Rivers, by A. S. Malkus (Doubleday, 1956), 221pp. illus. maps. The currents and streams in the ocean; the tides. **C, I, A**

Boy Beneath the Sea, by Arthur C. Clarke; photos by Mike Wilson (Harper, 1958), 64pp. Skin diving and underwater exploration around the coral reefs of Ceylon. Includes discussion of equipment, rules, and safety precautions. **C, I**

All About Volcanoes and Earthquakes, by Frederick H. Pough; illus. by Kurt Wiese (Random, 1950), 154pp. The causes and occurrences of volcanoes and earthquakes, with reports on some of the more spectacular. **C, I**

Water for America; the Story of Water Conservation, by Edward H. Graham and William R. Van Dersal (Oxford, 1956), 111pp. Full-page photos each with an accompanying page of text, showing where water is found, the many uses for it, and good and bad practice in water usage. **C, I**

All About the Weather, by Ivan R. Tannehill; illus. by Rene Martin (Random, 1953), 148pp. maps. Written by the director of weather reporting at the U.S. Weather Bureau. **C, I, A**

Weathercraft, by Athelstan Spilhaus (Viking, 1951), 64pp. photos, weather maps. How to make and use a rain-gauge and other instruments, keep records, and make weather predictions. **C**

Book of Storms, by Eric Sloane (Duell, 1956), 109pp. illus. maps. Cyclonic storms, tornadoes, hurricanes, thunderstorms, and other phenomena. **I, A**

Dust, by Irving Adler; illus. by Ruth Adler (Day, 1958), 122pp. How dust affects our lives, giving us blue skies, twilight, and beautiful sunsets, but also carrying germs and blackening the lungs of city dwellers. **C, I**

Mathematics (510–519)

Mathematical Dictionary, by Armen A. Alchian and others, ed. by Glen and Robert C. James (Van Nostrand, 1949), 432pp. illus. Terms and symbols used in pure and applied mathematics, including industry, commerce, and research; useful mathematical tables. **I, A**

World of Mathematics; . . . from A'h-mosé the Scribe to Albert Einstein, presented with commentaries and notes by James R. Newman (Simon, 1956), 4 vols., 2,535pp. illus. "Presents mathematics as a tool, a language, and a map; as a work of art, and as a fulfillment of the passion for perfection." Introduction. **I, A**

Wonderful World of Mathematics, by Lancelot T. Hogben; art by A. C. Keeping and Kenneth Symonds; maps by Marjorie Saynor (Garden City, 1955), 69pp. 250 col. plates, maps. How man gradually learned to count and to measure time, and to use mathematics in his various occupations. **C, I**

The New Mathematics, by Irving Adler (Day, 1958), 187pp. Recent changes in mathematical content and methods interpreted for the layman. **I, A**

How Much and How Many, written and illus. by Jeanne Bendick (McGraw, 1947), 182pp. 192 illus. The story of weights and measures and how they came to be used. **C, I, A**

High-Speed Mathematics, by Lester Meyers (Van Nostrand, 1947), 554pp. illus. Methods of rapid and mental computation of a variety of business problems, and ways of checking results. **I, A**

Basic Mathematics for Electricity, Radio, and Television, by Bernard B. Singer (McGraw, 1957), 513pp. illus. Each chapter covers a special mathematical operation or electrical concept, and each is illustrated by a series of examples. **I, A**

Magic House of Numbers, by Irving Adler; illus. by Ruth Adler (Day, 1957), 127pp. Tells how we came to use the digits 0 to 9, although there are many other ways to count, multiply, and divide; includes many mathematical riddles, tricks, and games. **C, I**

The Japanese Abacus; Its Use and Theory, by Takashi Kojima (Tuttle, 1953), 114pp. illus. Explains this ancient mathematical device, which is still used by many people in the Orient. **I, A**

Isaac Newton; Pioneer of Space Mathematics, by Beulah Tannenbaum and Myra Stillman; illus. by Gustav Schrotter (McGraw, 1959), 128pp. A biography that describes life in England in Newton's time, and tells how he became interested in mathematics and science. **I, A**

An Adventure in Geometry, written and illus. by Anthony Ravielli (Viking, 1957), 115pp. A demonstration, by means of pictures, of the relation of geometry to forms in nature and to man's productions. **C, I**

Physics (530–539)

The Growth of Physical Science, by Sir James H. Jeans (Cambridge, 1951), 364pp. A famous physicist writes a history of his subject. **A**

Physics for Everybody, by Germaine and Arthur Beiser (Dutton, 1956), 191pp. illus. A popular account of the natural phenomena of everyday life and how they are applied in recent inventions. **I, A**

All About the Atom, by Ira M. Freeman; illus. by George Wilde (Random, 1955), 146pp. The atom, how it works, and how the idea of it was developed. **C, I, A**

New World of the Atom, by James Stokley (Washburn, 1957), 288pp. illus. Popular explanation of the processes by which scientists reached their present discoveries and inventions. **I, A**

Atomic Quest; A Personal Narrative, by Arthur H. Compton (Oxford, 1956), 370pp. illus. The director of the Manhattan Project's Metallurgical Laboratory tells the story of the atomic bomb from its inception to its use in Japan. **I, A**

We Live By the Sun, by James G. Cook (Dial, 1957), 192pp. illus. The nature of light, heat conversion, man-made light, color; the reception and use of light by the eyes of man, animals, and telescopes; power from the sun. **I, A**

Experiments with Light, by Nelson F. Beeler and Franklyn M. Branley; illus. by Anne Marie Jauss (Crowell, 1957), 143pp. What we know about light and how we learned it; ways to measure light intensity, refraction; the "bullet" and the "wave" theories. **C**

Energy and Power, by Robert Irving [pseud. for Irving Adler]; illus. by Leonard E. Fisher (Knopf, 1958), 140pp. The sources of energy and power, such as wind, water, steam, gasoline, and electricity, and how man has put them to use. **C**

Magic of Sound, written and illus. by Larry Kettelkamp (Morrow, 1956), 62pp. Explanation of sound and how it is produced, captured, and transmitted; also covers echoes and "silent" sounds. **C**

Basic Electrical Principles, by Maurice G. Suffern; 2d ed. (McGraw, 1956), 454pp. illus. For electrical trades students. **C, I, A**

Understanding Electronics, from Vacuum Tubes to the Thinking Machine, by John B. Lewellen; illus. by Ida Scheib (Crowell, 1957), 213pp. The science and uses of electronics. **C**

Lens Magic, written and illus. by Frances Rogers (Lippincott, 1957), 160pp. The development of the microscope, the telescope, and the camera and their effects on modern life. **C**

Through the Magnifying Glass; Little Things That Make a Big Difference, by Julius Schwartz; illus. by Jeanne Bendick (McGraw, 1954), 142pp. On the kinds of lenses and how to use them. Describes a variety of experiments that can be performed with a simple magnifying glass. **C**

Experiments with a Microscope, by Nelson F. Beeler and Franklyn M. Branley; illus. by Anne Marie Jauss (Crowell, 1957), 154pp. How and why a microscope operates and how to handle it; simple experiments given. **C**

Fun with Science, by Mae and Ira Freeman; rev. ed. (Random, 1956), 64pp. illus. Experiments in physics, including jet action and atomics. **C**

Biological Sciences (560–599)

Includes anthropology, botany, fossils or paleontology, and zoology

General and Nature Study

Great Chain of Life, by Joseph Wood Krutch; illus. by Paul Landacre (Houghton, 1957), 227pp. Development of life from the one-celled paramecium to the giant mammals. **I, A**

The Web of Life, by John H. Storer (Devin-Adair, 1953), 144pp. A nontechnical study of the interrelationship of living things. **I, A**

The World We Live In, ed. by Lincoln Barnett (Simon, 1955), 304pp. illus. Various phases of natural history discussed by specialists. **I, A**

The Living Earth, by Peter Farb; photos by Roman Vishniac; drawings by Louise Katz (Harper, 1959), 178pp. The soil and the various kinds of life that dwell within it. **I, A**

Men, Microscopes, and Living Things, by Katherine B. Shippen; illus. by Anthony Ravielli (Viking, 1955), 192pp. How great naturalists of the past increased our knowledge, and how the invention of the microscope advanced biological research. **C, I**

Discovering Nature, by Charlotte Orr Gantz (Scribner, 1958), 239pp. illus. A series of personal adventures in many parts of the world. **C, I**

Rainbow Book of Nature, by Donald C. Peattie; illus. by Rudolf Freund (World, 1957), 319pp. Places and things that can be seen by almost anyone living in America. **C, I**

Field Guide to Animal Tracks, text and illus. by Olaus J. Murie (Houghton, 1954), 374pp. Tracks of most mammals, 30 birds, some reptiles, and a few insects. **C**

Autumn Across America, by Edwin Way Teale (Dodd, 1956), 386pp. photos, map. Subtitle: A Naturalist's Record of a 20,000-Mile Journey Through the North American Autumn. **C, I, A**

My Family and Other Animals, by Gerald Durrell (Viking, 1957), 273pp. An amusing account of five years spent by the author's family on Corfu Island when he was a boy and beginning to be interested in natural history. **I, A**

Beginner's Guide to Fresh-Water Life, text and illus. by Leon A. Hausman (Putnam, 1950), 128pp. Identifying descriptions of 250 inhabitants of swamps, ponds, lakes, and streams in the U.S. and Canada. **C**

The Pond Book, text and photos by Albro T. Gaul (Coward, 1955), 136pp. What to watch for and what happens, season by season. Covers not only aquatic life but animal visitors to the pond. **C**

Pets from the Pond, written and illus. by Margaret W. Buck (Abingdon, 1958), 72pp. The various kinds of plants and animals that can be kept in a home aquarium, and how to find, collect, and care for them. **C**

River World; Wildlife of the Mississippi, written and illus. by Virginia S. Eifert (Dodd, 1959), 271pp. The many kinds of plants and animals found along the banks and in the river. **C, I, A**

The Open Sea; Its Natural History; The World of Plankton, by Alister C. Hardy (Houghton, 1956), 335pp. 142 col. illus. 67 photos, 300 drawings and maps. Describes the small plants and animals that live on the surface of the sea, and how to net, observe, and preserve specimens. **I, A**

Exploring Under the Sea, by Sam Hinton; illus. by Rudolf Freund (Garden City, 1957), 64pp. A picture book showing the plants and animals, large and microscopic, that live in the ocean. **C**

Wonderful World of the Seashore, by Albro T. Gaul (Appleton, 1955), 247pp. illus. What to look for on trips along sandy or rocky coasts; flowers and bushes, shells, crabs, birds, and insects. **C, I, A**

Wildfolk in the Desert, by Carroll L. Fenton and Evelyn Carswell (Day, 1958), 128pp. 90 illus. Covers plant and animal life in the five great Western deserts. **C**

Unseen Life of New York, As a Naturalist Sees It, by William Beebe; illus. by Donald T. Carlisle (Duell, 1953), 165pp. map. Tells of a variety of insect, bird, and animal life, seen and unseen, present, recent, and prehistoric. **I, A**

Magic Bullets; The Story of Man's Valiant Struggle Against Enemy Microbes, by Louis Sutherland; illus. by Harper Johnson (Little, 1956), 148pp. The vaccines, molds, and antibiotics that protect us against epidemics. Guide to pronunciation. **C**

Anthropology (570)

Story of People; Anthropology for Young People, by May Edel; illus. by Herbert Danska (Little, 1953), 197pp. Descriptions of several primitive groups, including an African tribe with whom the author lived for a year. **C, I**

In Search of Adam; the Story of Man's Quest for the Truth About His Earliest Ancestors, by Herbert Wendt; trans., James Cleugh (Houghton, 1956), 540pp. photos, illus. Stories of the lives and activities of some of the famous workers on the problem of the origin of man. **I, A**

Man, His First Million Years, by Ashley Montagu (World, 1957), 249pp. illus. How the races and cultures of man acquired their distinctive characteristics; how language, religion, and the arts developed; how sex and marriage patterns vary. **I, A**

Four Ways of Being Human; an Introduction to Anthropology, by Genevieve Lisitzky; illus. by C. B. Falls (Viking, 1956), 303pp. Four primitive tribes living in completely different lands and climates. **I, A**

Everyday Life in the New Stone, Bronze, and Early Iron Ages, written and illus. by Marjorie and C. H. B. Quennell; 5th ed. (Putnam, 1955), 119pp. map. **C**

People, by Irvin Block (Watts, 1956), 184pp. Discussion of the customs, morals, and cultures of people in other parts of the world that provide a better understanding of our own society. **I, A**

Americans Before Columbus, by Elizabeth C. Baity; illus. by C. B. Falls (Viking, 1951), 256pp. photos. The Mound Builders, Mayas, Incas, Eskimos, and various Indian tribes; how they lived and what happened to them. **I**

Wonderful World of Archaeology, by Ronald F. Jessup (Garden City, 1956), 65pp. illus. maps. The story of archaeology, from the amateur collectors of Ur to the highly trained scientist with his radio carbon dating. **C, I**

Gods, Graves, and Scholars; the Story of Archaeology, by Kurt W. Marek (Knopf, 1951), 426pp. illus. bibliog. A survey of archaeological achievement, shown largely in terms of colorful episodes and personalities in the field. **A**

Botany (580–589)

Botany for Gardeners, by Harold W. Rickett (Macmillan, 1957), 236pp. illus. How seeds sprout, plants flower, and trees expand; discussion on the naming of plants. **I, A**

Wonders of Seeds, by Alfred Stefferud; illus. by Shirley Briggs (Harcourt, 1956), 119 pp. How seeds sprout and grow into plants which blossom and bear fruit filled with new seeds. **C**

Plants That Feed Us; The Story of Grains and Vegetables, by Carroll L. Fenton and Herminie B. Kitchen (Day, 1956), 95pp. illus. Stories of the development of food plants from their original forms, of farmers in ancient times, and of the explorers who took plants from one continent to another. **C**

Edible Wild Plants of Eastern North America, by Merritt L. Fernald and Alfred C. Kinsey, rev. by Reed C. Collins (Harper, 1958), 452pp. illus. Covers all important edible flowering plants and ferns, mushrooms, seaweeds, and lichens, plus a chapter on poisonous flowering plants. **I, A**

F. Schuyler Mathews' Field Book of American Wild Flowers, completely rev. and enl. by Norman Taylor (Putnam, 1955), xxix, 601pp. illus. Names and ranges have been corrected, and new species added to this 50-year-old classic. **C, I, A**

American Wildflowers, by Harold Moldenke (Van Nostrand, 1949), 453pp. 155 illus. Handbook for identifying 2,043 species found in North America north of Mexico. **I, A**

Field Book of Common Mushrooms, With a Key to Identification of the Gilled Mushrooms, and Directions for Cooking Those That Are Edible, by William S. Thomas; 3rd ed. (Putnam, 1948), xx, 369pp. 93 col. illus., drawings. **I, A**

Field Guide to the Ferns and Their Related Families of Northeastern and Central North America, With a Section on Species Found in the British Isles and Western Europe, by Boughton Cobb (Houghton, 1956), 281pp. illus. Drawings show full plant, spore cases, leaf pattern, and other characteristics. **I, A**

The Tree Identification Book, by George W. D. Symonds; photos by Stephen V. Chelminski (Morrow, 1958), 272pp. 1,539 photos. Identification of 130 trees by pictures and keys. **C, I, A**

Book of Trees, by Alfred Hottes (De La Mare, 1952) 440pp. illus. map. Legends, stories, poems, and descriptions of historic trees; discussion of tree repair, street trees, and related topics. **I, A**

Natural History of Trees of Eastern and Central North America, by Donald C. Peattie (Houghton, 1951), 606pp. illus. Description of trees by family, discussing any items of special interest; keys to genera and species. **I, A**

Natural History of Western Trees, by Donald C. Peattie (Houghton, 1953), 751pp. illus. Nontechnical description of 200 trees in the western U.S. and Canada. **I, A**

Fossils or Paleontology (560–569)

The Fossil Book . . ., by Carroll L. and Mildred A. Fenton (Doubleday, 1958), 482pp., col. plates, photos, drawings. Subtitle: The Exciting Story of Plants, Animals, and Lesser Creatures During the Past Two Billion Years. **I, A**

Prehistoric Animals, by Samuel and Beryl Epstein; illus. by W. R. Lohse (Watts, 1957), 210pp. Evolvement of animals from prehistoric times. **C**

Millions of Years Ago, by Edwin H. Colbert; illus. by Margaret M. Colbert (Crowell, 1959), 153pp. An account of life in North America from mid-Paleozoic times, and of a paleontologist's work in the field and in the laboratory. **C, I**

All About Dinosaurs, by Roy Chapman Andrews; illus. by Thomas W. Voter (Random, 1953), 146pp. maps. A survey of the earth in the time of reptiles; the author's experiences in fossil hunting. **C**

Zoology (590–599)

General and Lower Forms of Animal Life (590–593)

Animals Without Backbones; An Introduction to the Invertebrates, by Ralph Bucksbaum; rev. ed. (Univ. of Chicago, 1948), 405pp. 550 illus. A guide to the spineless 95% of the animal kingdom, from the simplest one-celled animals to the highly organized insects, and the unclassifiable starfishes. **I, A**

Field Book of Seashore Life, by Roy W. Miner (Putnam, 1950), 888pp. illus. A manual of the more common invertebrates inhabiting shallow coastal waters from Labrador to Cape Hatteras. **I, A**

American Seashells, by Robert T. Abbott (Van Nostrand, 1953), 541pp. illus. 40 plates. Descriptions of some 1,500 species from both the Atlantic and Pacific coasts of North and Central America. **I, A**

Sea Treasure; a Guide to Shell Collecting, by Kathleen Y. Johnstone; illus. by Rudolf Freund and René Martin (Houghton, 1957), 242pp. Where and when to find shells; how to clean, label, and store them; American Indian shell money and decoration. **I, A**

Wonder World of Microbes, by Madeleine P. Grant; illus. by Clifford N. Geary (McGraw, 1956), 160pp. Description of microbes, their lives and behavior, their breeding places, and their roles in human life. **C, I**

Wild Life at Your Doorstep, written and illus. by Glen Rounds (Prentice, 1958), 115pp. Life that can be observed just outside the door, such as ants, wasps, spiders, squirrels, and toads. **C**

Vertebrates of the United States, by W. Frank Blair and others (McGraw, 1957), 819pp. illus. A taxonomic manual of all known vertebrates occurring in the U.S., and the marine birds and mammals of adjacent waters. Illustrated keys. **I, A**

Listening Point, by Sigurd F. Olson; illus. by Francis L. Jaques (Knopf, 1958), 242pp. Adventures of a naturalist in the Quetico-Superior region of northern Canada. **C, I, A**

The Arctic Wild, by Lois Crisler; photos by Herb Crisler (Harper, 1957), 310pp. The authors spent several months in the Brooks Range of Alaska, taking photographs of wild animals which had never learned any fear of human beings. **C, I, A**

The Windward Road, by Archie Carr (Knopf, 1956), 258pp. illus. maps. A naturalist's adventures with giant turtles and other animals of the Caribbean. **I, A**

Zoo Expeditions, by William Bridges (Morrow, 1954), 191pp. illus. maps. Stories of seven expeditions to acquire animals for New York's Bronx Zoo. **C**

How to Make a Miniature Zoo, by Vinson Brown; rev. ed. (Little, 1957), 212pp. illus. Plans for six different types of zoo; how to collect and care for different creatures. **C**

Practical Taxidermy, by John W. Moyer (Ronald, 1953), 126pp. illus. Information on the mounting of birds, fish, reptiles, and mammals, and the making of fur rugs. **I, A**

Insects and Spiders (595)

Field Book of Insects of the United States and Canada, by Frank E. Lutz (Putnam, 1935), 510pp. 800 illus. col. plates. Descriptions and keys to many of the insects of northeastern North America. **I, A**

Insect Fact and Folklore, by Lucy W. Clausen (Macmillan, 1954), 194pp. illus. Tells about insects as they affect man, and some of the superstitions, legends, curious beliefs, and scientific facts about them. **I, A**

Insects in Your Life, by C. Howard Curran (Sheridan, 1951), 316pp. illus. Description of some of the insects and their allies that affect our lives beneficially or harmfully. **I, A**

Wonderful World of Insects, text and photos by Albro T. Gaul (Rinehart, 1953), 290pp. The importance of the largest of all classes of animals; the life cycles of insects; their relation to man. **C, I, A**

Insects on Parade, written and illus. by Clarence J. Hylander (Macmillan, 1957), 208pp. Descriptions of the more common insects. **C**

American Social Insects; A Book about Bees, Ants, Wasps, and Termites, by Charles D. and Mary H. Michener (Van Nostrand, 1951), 267pp. photos. The elaborate life cycles and habits of the insects that live together in huge families. **I, A**

Ways of the Ant, by John B. Compton Lamburn (Houghton, 1954), 242pp. illus. Comparison of ants with mankind: their soldiers, farmers, dairymen, and even alcoholics. **I, A**

Insect Engineers; The Story of Ants, written and illus. by Ruth Bartlett (Morrow, 1957), 128pp. Description of ants, their social habits, and the structures they build; methods of collecting, maintaining, and observing ants. **C**

Makers of Honey, by Mary Phillips; illus. by Elizabeth Burckmyer (Crowell, 1956), 163pp. Describes the curious life and habits of bees; how they make and store their honey; how to raise bees in the city or in the country. **C**

The Spider Book, by John H. Comstock, rev. and ed. by Willis J. Gertsch (Doubleday, 1948), 730pp. illus. photos. Description of habits and identification keys to spiders, scorpions, daddy-long-legs, and their allies found in America north of Mexico. **I, A**

American Spiders, by Willis J. Gertsch (Van Nostrand, 1949), 285pp. 32 col. plates, 110 illus. The habits, webs, and habitats of all groups of American spiders, with descriptions of typical species in each group. **C, I, A**

Field Guide to the Butterflies of North America, East of the Great Plains, by Alexander B. Klots; col. plates by Marjorie Statham; photos by Florence Longworth (Houghton, 1951), 349pp. Habits, range, and identification of both the butterflies and their caterpillars; instructions on collecting and preserving. **I, A**

Fish (597)

The Book of Fishes, ed. by John O. La Gorce (Nat'l Geographic Soc., 1952), 339pp. 236 species in col., 67 other col. photos, 170 black and white photos. Subtitle: Presenting the Better Known Food and Game Fishes, and the Aquatic Life of the Coastal and Inland Waters of the United States. **C, I, A**

Field Book of Marine Fishes of the Atlantic Coast from Labrador to Texas, by Charles M. Breder (Putnam, 1929), 370pp. 8 col. plates, 403 illus. Habits and characteristics, with keys to identification. **I, A**

Encyclopedia of Tropical Fishes, With Special Emphasis on Techniques of Breeding, by Herbert R. Axelrod and William Vorderwinkler; 2d ed. (Sterling, 1958), 763pp. photos. **I, A**

Tropical Aquarium Fish in Color, by G. Mandahl-Barth; 225 col. illus. by N. Norvil (Dutton, 1959), 138pp. 190 species described and illustrated, with instructions for home aquarium care. **I, A**

Salt-Water Aquarium Fish, by Herbert R. Axelrod and William Vorderwinkler (Sterling, 1956), 160pp. illus. How to start and maintain a salt-water aquarium. **I, A**

Snakes, Lizards, Toads, and Frogs (598)

Natural History of North American Amphibians and Reptiles, by James A. Oliver (Van Nostrand, 1955), 359pp. illus. map. An account of the life history, habits, and folklore of lizards, toads, turtles, snakes, and the like, by the director of the American Museum of Natural History. **C, I, A**

Animals in Armor, by Clarence J. Hylander (Macmillan, 1954), 203pp. illus. Descriptions of common alligators, lizards, snakes, and turtles, with notes on their habits, habitats, and enemies. **I, A**

Handbook of Snakes of the United States and Canada, by Albert H. and Anna A. Wright (Comstock, 1957), 2 vols., 1,105pp. illus. maps. Description of species, with range, habitat, habits, food, venom, and enemies. **I, A**

Boy's Book of Frogs, Toads, and Salamanders, by Percy A. Morris (Ronald, 1957), 240pp. illus. Where to look for them; how to identify them; how to capture and care for them. **C, I**

Birds (598)

Living Birds of the World, by E. Thomas Gilliard (Doubleday, 1958), 400pp. photos, 200 col. photos. Descriptions of 1,500 bird species. **C, I, A**

Audubon Guides; All the Birds of Eastern and Central North America, by Richard H. Pough; 885 col. illus. by Don Eckelberry; line drawings by Earl L. Poole (Doubleday, 1953), 2 vols in one (xlii, 312; xxviii, 352pp.). First section deals with small land birds; the second with water, game, and large land birds. **C, I, A**

Audubon Western Bird Guide . . ., by Richard H. Pough; col. illus. by Don Eckelberry, line drawings by Terry M. Shortt (Doubleday, 1957), xxxvi, 316pp. Land and water birds of western North America, from Mexico through Alaska. Sponsored by the National Audubon Society. **I, A**

Field Guide to the Birds, by Roger Tory Peterson (Houghton, 1947), 290pp. illus. maps. Field identification of all species east of the Rockies. Sponsored by the National Audubon Society. **C, I, A**

Bird Biographies, by John J. Audubon, selected and ed. by Alice Ford (Macmillan, 1957), 282pp. 80 bird biographies illus. with 12 color reproductions of Audubon originals. **I, A**

A Guide to Bird Songs, by Aretas Saunders (Doubleday, 1951), 307pp. Subtitle: Descriptions and Diagrams of the Songs and Singing Habits of Land Birds and Selected Species of Shore Birds. **I, A**

On the Trail of the Vanishing Birds, by Robert P. Allen (McGraw, 1957), 251pp. illus. The author's search for the whooping crane, the flamingo, and the spoonbill. **I, A**

Mammals (599)

Living Mammals of the World, by Ivan T. Sanderson

(Doubleday, 1955), 303pp. photos. Popular descriptions, with pictures. **C, I, A**

Mammals of North America, by E. Raymond Hall and Keith R. Kelson (Ronald, 1959), 2 vols. 1,372pp. illus. maps. Descriptions of the 3,800 named species, with maps showing geographical distribution. **I, A**

Winter-Sleeping Wildlife, by Will Barker (Harper, 1958), 136pp. illus. The wintering habits of many familiar North American creatures. **C, I**

Animals in Fur, by Clarence J. Hylander (Macmillan, 1956), 206pp. illus. An introduction to the mammals of the U.S., from moles to whales, giving their characteristics, habitats, and ways of adapting to their environment. **C**

Animals That Help Us; the Story of Domestic Animals, by Carroll L. Fenton and Herminie B. Kitchen (Day, 1959), 128pp. illus. Traces the origin of every important domestic animal in the Old World and the New. **C**

Walt Disney's Worlds of Nature, by Rutherford Platt and the staff of the Walt Disney Studio . . . (Simon, 1957), 176pp. col. photos. A picture book showing the animals of seven areas: mountains, forests, plains, deserts, swamps, seas, and icebergs. **C**

Walt Disney's Vanishing Prairie, by Jane Werner and the Staff of the Walt Disney Studio (Simon, 1955), 124pp. col. photos. Many colored photos and some text describing the lives of wild animals on the prairie from spring until frost. **C, I, A**

Walt Disney's True-Life Adventures, text by Jane W. Watson and Frances Pryor; col. photos by Walt Disney Studio (Golden, 1959), 124pp. Short chapters on humorous or dramatic episodes in the lives of wild animals. **C, I, A**

Treks Across the Veldt, by Theodore Waldeck; illus. by Ivan T. Sanderson (Viking, 1944), 213pp. Experiences trapping wild animals alive and unhurt in Africa. **C, I, A**

Zoo Doctor, by William Bridges (Morrow, 1957), 126pp. illus. Daily problems in the lives of a zoo doctor, his nurse, and his hospital attendant. **C**

Medical Sciences (610–619)

Includes biographies, careers, child health, mental and emotional health, nursing and public health, and physiology

General and Physiology; Nursing

The Physiology of Man, by L. L. Langley and E. Cheraskin; 2d ed. (McGraw, 1958), 674pp. illus. Author defines physiology as the study of the mechanisms that keep the internal environment constant, and the description of the body systems is made from the point of view of their integration. **I, A**

Dorland's Illustrated Medical Dictionary, ed. by Leslie B. Arey and others; philological consultants, P. J. Alexander and H. K. Messenger . . .; 23rd ed. (Saunders, 1957), 1,598pp. 50 plates, 700 illus. Contains also a table of modern drugs and dosage and an article on medical etymology. **I, A**

Handy Home Medical Adviser, and Concise Medical Encyclopedia . . ., by Morris Fishbein (Hanover, 1957), 394pp. illus. An enlargement and combination of Fishbein's earlier ed. with Good Housekeeping's Pocket Medical Encyclopedia. **A**

First Aid Textbook, prepared by the American National Red Cross for the instruction of first aid classes; 4th ed. (Doubleday, 1957), 241pp. 249 illus. Deals with simple anatomical structure, common injuries, types of dressings and bandages, and lay treatment of emergencies. **C, I, A**

Science and the Doctor, by F. R. Elwell and J. M. Richardson (Criterion, 1959), 160pp. How the growth of medical knowledge and skills is aided by inventions and discoveries in the physical and biological sciences; *i.e.*, the lens, the stethoscope, the discovery of microscopic life. **C, I**

Magic, Myth, and Medicine, by Donald T. Atkinson (World, 1956), 319pp. Short essays on important incidents in medical history. **I, A**

Man Against Germs, by Abraham L. Baron; decorations by Dora Baron (Dutton, 1957), 320pp. illus. The story of 13 of the germs that cause infectious diseases, and the means that scientists have developed to combat them. **I, A**

Mankind Against the Killers, by James Hemming (Longmans, 1956), 231pp. illus. maps. Story of the efforts to control and stamp out the age-old diseases. **C, I**

New Advances in Medicine—and What They Mean to You, by Morris Fishbein (Hanover, 1956), 224pp. The discovery and application of the "wonder" drugs and the vaccines, and the latest achievements in diagnosis and treatment of disease. **I, A**

Radiation; What It Is and How It Affects You, by Jack Schubert and Ralph E. Lapp (Viking, 1957), 314pp. The beneficial uses of radiation in medicine, and its mounting dangers. Glossary and bibliography. **I, A**

Fight for Fluoridation, by Donald R. McNeil (Oxford, 1957), 241pp. Arguments on both sides of the controversy. Bibliography. **A**

Your Wonderful Body, by Peter P. Chase (Prentice, 1957), 391pp. illus. Explains the workings of the human body, and gives advice on such subjects as rest and pain, immunity, emotions, drugs, and allergies. **I, A**

You and Your Senses, by Leo Schneider; illus. by Gustav Schrotter (Harcourt, 1956), 137pp. illus. An explanation, with accompanying experiments, of the mechanisms of the human body which enable us to see, smell, taste, touch, and hear. **C, I**

Textbook of Healthful Living, by Harold S. Diehl; 5th ed. (McGraw, 1955), 802pp. 65 illus. Survey of the field, with practical discussions of ways to improve and preserve personal health. **I, A**

Health and Hygiene for the Modern Woman, by Leonard H. Biskind (Harper, 1957), 219pp. Female anatomy and functions described; problems of hygiene, cosmetics, and diet discussed; questions about malfunctions, cancer, and Caesarean surgery answered. **I, A**

Our Wonderful Eyes, by John Perry; illus. by Jeanne Bendick (McGraw, 1955), 158pp. The meaning of sight and how the eyes work. **C, I**

American Nursing: History and Interpretation, by Mary M. Roberts (Macmillan, 1954), 688pp. illus. Development of professional nursing in the U.S.; an analysis of its trends; an interpretation of its functions and aims. **I, A**

Biographies

Men of Medicine, by Katherine B. Shippen; illus. by Anthony Ravielli (Viking, 1957), 220pp. illus. The lives and works of distinguished doctors, covering a period of 5,000 years. **C**

Women Doctors of the World, by Esther P. Lovejoy (Macmillan, 1957), 413pp. illus. Entrance of women into the medical profession in the 18th century in Europe, and in the mid-19th in the U.S. Present fields of service of women doctors and surgeons. **I, A**

Pioneer Surgeon: Dr. Ephraim McDowell, by Josephine Rich (Messner, 1959), 192pp. illus. The Kentucky boy who became a surgeon in an age when few dared to operate. **C, I**

The Surgeon's Tale, by Robert G. Richardson (Scribner, 1959), 278pp. illus. Surgery from the discovery of anaesthesia through the techniques developed during World War II. **I, A**

Careers in Medicine

Doctors, and What They Do, by Harold Coy (Watts, 1956), 183pp. The various kinds of medical work, with a glossary of common medical terms and specialties. **C, I**

So You Want to Be a Doctor, by Alan E. Nourse

(Harper, 1957), 189pp. Discussion of the restrictions and responsibilities of a medical career, and also its cost in time and money required for preparation. **C, I**

Medicine in Action; Today and Tomorrow, by Margaret O. Hyde; illus. by Clifford N. Geary (McGraw, 1956), 160pp. Description of 150 vocational opportunities in the medical fields, with educational requirements, length of training, etc. **I**

Handbook for the Medical Secretary, by Miriam Bredow (McGraw, 1954), 390pp. illus. Procedures in a doctor's office, clinical-technological tasks, the work of a dental secretary, bookkeeping and collection methods. **I, A**

Careers for Nurses, by Dorothy Deming; 2d ed. (McGraw, 1952), 351pp. Describes 15 branches of nursing. **I, A**

Child Health

When Your Child Is Ill, by Samuel Karelitz (Simon, 1957), 485pp. illus. Description of the common diseases of children, with information on vaccines and wonder drugs. **A**

Our Backward Children, by Karl F. Heiser (Norton, 1955), 240pp. Designed to reorient the attitude of parents who are ashamed of their retarded child. **A**

Your Child or Mine; the Brain-Injured Child and His Hope, by Oreste E. Hood (Harper, 1957), 180pp. Story of the work being done by the Los Angeles Institute for Child Study. **A**

Expectant Motherhood, by Nicholson J. Eastman; 3rd ed. (Little, 1957), 198pp. illus. Advice from the chief obstetrician at Johns Hopkins Hospital on the uncertainties that arise from day to day. **A**

Getting Ready for Parenthood, by Mario A. Castallo and others (Macmillan, 1957), 192pp. illus. A manual; contains chapters on natural childbirth and on rooming-in. **A**

(See also *Home Economics, Child Care.*)

Mental and Emotional Health

Psychiatry and Common Sense, by C. S. Bluemel (Macmillan, 1954), 259pp. A nontechnical survey of psychiatric aims and methods. **A**

The Mind Alive, by Harry A. and Bonaro Overstreet (Norton, 1954), 333pp. The obstacles that interfere with mental health and how to circumvent them. **I, A**

Emotional Problems of Living; Avoiding the Neurotic Pattern, by Oliver S. English and G. H. J. Pearson; rev. ed. (Norton, 1955), 592pp. The development of desirable personality patterns. **I, A**

How to Keep a Sound Mind, by John J. B. Morgan; rev. ed. (Macmillan, 1946), 404pp. illus. Develops the thesis that mental health depends largely upon the formation of certain mental habits, and the elimination of certain others. **I, A**

Teach Yourself to Relax, by Josephine L. Rathbone (Prentice, 1957), 216pp. illus. How to recognize the signs of tension; how to identify the causes; and how to apply psychological and physical aids; how to counteract insomnia. **I, A**

Live longer—and enjoy it! by Peter J. Steincrohn (Prentice, 1956), 256pp. Attitudes and habits that affect longevity and health, with advice on choosing a doctor, a hospital, a vacation. **A**

How to Live With a Neurotic, by Albert Ellis (Crown, 1957), 206pp. Designed to enable the layman to understand the basic factors in emotional upsets, to help the troubled person to overcome his disturbances, and to live with him. **A**

Mental Illness; a Guide for the Family, by Edith Stern, with a foreword by William C. Menninger; rev. ed. (Harper, 1957), 95pp. Combats common fallacies about mental illness; describes functions and activities of mental hospitals. **A**

Emotional Illness; How Families Can Help, by Karl R. Beutner and Nathan G. Hale, Jr. (Putnam, 1957), 158pp. Attempts to promote within the family the attitudes which will best help the patient. **A**

Psychology (150–159)

Elements of Psychology, by David Krech and Richard S. Crutchfield (Knopf, 1958), 700, xxvipp. illus. A survey of psychological knowledge to date, and the experiments on which it is based. **A**

Understanding Our Behavior; the Psychology of Personal and Social Adjustment, by Lester D. and Alice Crow (Knopf, 1956), 347pp. illus. bibliog. A nontechnical text applying the fundamentals of psychology to everyday living. **I, A**

Basic Psychology; A Study of the Modern Healthy Mind, by Leonard Carmichael (Random, 1957), 340pp. An explanation of the working of the brain and mind, of the drives and motives of behavior, of human engineering, efficiency, and fatigue. **I, A**

Psychology Applied to Life and Work, by Harry W. Hepner; 3rd ed. (Prentice, 1957), 639pp. illus. A presentation of psychological principles that are fundamental to everyday living. **I, A**

Applied Imagination; Principles and Procedures of Creative Thinking, by Alexander F. Osborn; rev. ed. (Scribner, 1957), xxiii, 379pp. Ways of developing imagination in home, school, and work situations. **I, A**

Child Development; An Introduction to the Study of Human Growth, by Arnold Gesell and others (Harper, 1949), 2 vols. in one, illus. Vol. 1. *Infant and Child in the Culture of Today.* Vol. 2. *The Child from Five to Ten.* The characteristics of each year of growth, with advice on guidance and psychological care. **A**

Psychology of Adolescence, by Arthur T. Jersild (Macmillan, 1957), 438pp. illus. bibliog. An explanation of the emotions of adolescents written for both the teen-ager and his elders. **I, A**

Adolescent Development and Adjustment, by Lester D. and Alice Crow (McGraw, 1956), 555pp. illus. Discussion of the physical, mental, and emotional growth of teen-agers. **A**

Increasing Personal Efficiency, by Donald Laird (Harper, 1952), 294pp. Self-help through personal application of psychology. Aids suggested for improving memory, changing habits, and remaking personality. **I, A**

Social Sciences (300–399)

Includes economics, education, folklore, law, military defense, political science, public administration, and social welfare

General

Includes grouping by age and rank; public opinion

Dictionary of Social Science, by John T. Zadrozny (Public Affairs, 1959), 367pp. Definitions of terms used in various specialties, including terms used in more than one way, and concepts given more than one term. **A**

A Preface to the Social Sciences, by Raymond F. Bellamy and others (McGraw, 1956), 532pp. illus. The study of man, his dependence on the land and on other persons; the problems of making a living, of family development, and of social control. **I, A**

Sociology; An Analysis of Life in Modern Society, by Arnold W. Green (McGraw, 1956), 576pp. 261 illus. A survey of man and his world in a society where an organization becomes a person, describing social institutions and social change. **A**

Sociology, by Emory S. Bogardus; 4th ed. (Macmillan, 1954), 616pp. A survey of the great divisions in human society, their influence on their constituents and on each other. **A**

Statistical Abstract of the United States, by the U. S. Bur. of the Census (U. S. Govt. Ptg. Off., annually) Statistics of agriculture, population, manufacturing, mining, commerce, finance, climate, etc. **I, A**

The Sociological Imagination, by Charles W. Mills (Oxford, 1959), 234pp. A cultural critique of American social scientists. **A**

The Status Seekers, by Vance Packard (McKay, 1959), 376pp. Subtitle: An Exploration of Class Behavior in America, and the Hidden Barriers That Affect You, Your Community, Your Future. The author sees an increase in class divisions and rigidity, and lists items that determine prestige or status. **A**

Modern Public Opinion, by William Albig (McGraw, 1956), 518pp. 198 illus. Discussion of the nature of public opinion, the various methods of measuring it, the change in opinion, and mass media. **I, A**

Sampling Opinions; An Analysis of Survey Procedure, by Frederick S. Stephan and P. J. McCarthy (Wiley, 1958), 451pp. tables, bibliog. Technical discussion of the complex procedures involved in large-scale surveys, and the problems that arise in applying sampling to a new study. **A**

Organization Man, by William H. Whyte (Simon, 1956), 429pp. illus. maps. A plea for men to resist conformity in business and social life, and to consult their own consciences on matters of right and wrong. **I, A**

Cities in the Motor Age, by Wilfred Owen (Viking, 1959), 176pp. illus. The opposing purposes of cities and automobiles, and the increasing suburban blight. **I, A**

Great Cities of the World; Their Government, Politics, and Planning, by William A. Robson; 2d ed. (Macmillan, 1957), 814pp. illus. map, bibliog. Articles by a specialist on 20 cities throughout the world, except the Orient. **I, A**

Living in the City, by A. Elwood Adams and Edward E. Walker (McGraw, 1949), 224pp. illus. The important aspects and problems of city living, and plans for cities of the future. **C, I**

American Teenager, by H. H. Remmers and D. H. Radler (Bobbs, 1957), 267pp. illus. An interpretation of the findings of the Purdue Opinion Panel on the attitude of young people toward politics, parents, education, courting, and other matters affecting their future. **I, A**

Economics (330–339)

A History of Economic Thought, by John F. Bell (Ronald, 1953), 696pp. bibliog. A survey of the evolution of economic thought from Biblical times to the mid-20th century, describing the important European and American doctrines and their proponents. **A**

Introduction to Economics, by Joseph T. Morgan; 2d ed. (Prentice, 1956), 799pp. A nontechnical description of basic economic problems, addressed to the American businessman, with sections on international economics and the underdeveloped areas of the world. **A**

Economics for Living, by George H. Soule; illus. by Bunji Tagawa (Abelard, 1954), 161pp. map. The basic principles of economics related to the problems of everyday life. **I**

The Quest for Wealth; a Study of Acquisitive Man, by Robert L. Heilbroner (Simon, 1956), 278pp. The origin, nature, historical manifestation, and current role in society of the universal drive for acquisition. **A**

The Story of Paper Money, by Fred Reinfeld (Sterling, 1957), 128pp. illus. Its world-wide history from 14th-century China to the present. **I, A**

Economic Roads for American Democracy, by William Van Til (McGraw, 1947), 252pp. illus. A discussion of five major trends of thought on what Americans should do to achieve and maintain a high level of prosperity. **I, A**

Freedom and Plenty; Ours to Save, written and illus. by Wilfred S. Bronson (Harcourt, 1953), 123pp. Amusing illustrations and many practical suggestions for children to stress the importance of conservation for each individual. **C, I**

Labor in America; a History, by Foster R. Dulles; rev. ed. (Crowell, 1955), 421pp. Story of the growth of labor unions in the U.S. from colonial background to the A.F.L.-C.I.O. merger. **I, A**

AFL—CIO: Labor United, by Arthur J. Goldberg (McGraw, 1956), 319pp. The significance of the merger; the probable effects on collective bargaining and political action; the growing issue of union monopoly. **I, A**

Wall Street; the Story of the Stock Exchange, by Dorothy Sterling; photos by Myron Ehrenberg (Doubleday, 1955) 128pp. History of Wall Street. **C, I**

Stock Market, by George L. Leffler; 2d ed. (Ronald, 1957), 626pp. illus. The stock market and its operations; investing and trading in common stocks; investment plans and formulas. **I, A**

Education (370–379)

Education and Freedom, by H. G. Rickover (Dutton, 1959), 256pp. The admiral who developed the nuclear-powered submarine argues for a change in educational ideals. **A**

The Integrated Classroom, by Hermann H. Giles (Basic, 1959), 338pp. Suggestions on expediting peaceful integration, based on his own years of experience in integrating schools in all parts of the country. **A**

How to Get the Best Education for Your Child, by Benjamin and Lillian Fine (Putnam, 1959), 251pp. Suggestions on teaching methods, textbooks, homework; on choosing a school, from nursery to college. Contains a check list for evaluating a public-school system. **A**

Fine's American College Counselor and Guide, by Benjamin Fine; 1958–1959 ed. (Prentice, 1957), 240pp. Information on admission requirements, costs, scholarships, employment opportunities, etc. Directories of universities, colleges, junior colleges, and medical schools. **I**

How to Pass College Entrance Tests, by David R. Turner and Alison Peters; 3rd ed. (Arcor, 1956), 185pp. illus. Complete list of U.S. colleges, with entrance test requirements of each. Study materials for the more important tests. **I**

Psychology of Careers; an Introduction to Vocational Development, by Donald E. Super (Harper, 1957), 362pp. Reports on the results of research and theory development by psychologists, sociologists, and economists. **A**

Occupations Today, by John M. Brewer and Edward Landy; new ed. (Ginn, 1956), 382pp. illus. Considers the general education needed for various employment fields, with advice on getting and holding a job. **I**

Bright Children; a Guide for Parents, by Norma E. Cutts and Nicholas Moseley (Putnam, 1953), 238pp. How to help a child make the most of his intelligence; where to seek expert advice; whether to choose public or private school. **A**

Study Successfully; 18 Keys to Better Work, by Norris E. Orchard; illus. by Barbara Bridgman (McGraw, 1953), 80pp. How to read, plan compositions, take notes, memorize; how to find unlisted information. **C, I**

Folklore (398)

Bulfinch's Mythology: Age of Fable; Age of Chivalry; Legends of Charlemagne, by Thomas Bulfinch; illus. by Elinore Blaisdell (Crowell, 1947), 957pp. map. The famous collection of European folklore and myth combined in one vol. with a dictionary index. **I, A**

Greek Myths, by Olivia E. Coolidge; illus. by E. Sandoz (Houghton, 1949), 243pp. A retelling of the best known of the Greek myths; table of the chief gods of the ancient Greeks. **C, I, A**

Legends of the North, by Olivia E. Coolidge; illus. by E. Sandoz (Houghton, 1951), 260pp. A retelling of legends from Norse eddas and sagas. **C, I, A**

Did You Feed My Cow?, comp. by Margaret Taylor; illus. by Paul Galdone (Crowell, 1956), 83pp. A collection of children's rhymes, games, and chants, garnered from the children themselves. **C**

Treasury of American Folklore; Stories, Ballads, and Traditions of the People, ed. by Benjamin A. Botkin (Crown, 1944), xxvii, 932pp. music. Also contains jokes and expressions. **C, I, A**

Book of Negro Folklore, ed. by Langston Hughes and Arna W. Bontemps (Dodd, 1958), 624pp. Includes animal tales and rhymes, slave stories, magic, Harlem jive, jokes, songs, and the poetry and prose of Negro writers. No index. **C, I, A**

Treasury of Western Folklore, ed. by Benjamin A. Botkin (Crown, 1944), xxvi, 806pp. music. Tall tales, legends, and songs of the people of the Great Plains and the West. **C, I, A**

Treasury of Mexican Folklore, by Frances Toor; illus. by Carlos Merida (Crown, 1947), xxxii, 566pp. 10 col. plates, 100 illus. 170 photos. Subtitle: The Customs, Myths, Folklore, Traditions, Beliefs, Fiestas, Dances, and Songs of the Mexican People. **I, A**

Home Book of Proverbs, Maxims, and Familiar Phrases, ed. by Burton Stevenson (Macmillan, 1948), 2,957pp. Sayings and expressions commonly used in the U.S. and England traced from their sources through variations to their modern forms. **I, A**

Superstitious? Here's Why! by Julie F. Batchelor and Claudia DeLys; illus. by Eric Blegvad (Harcourt, 1954), 129pp. The origin and reasons behind common sayings and practices associated with good and bad luck. **C, I, A**

Touch Blue; Signs and Spells, Love Charms and Chants, Auguries and Old Beliefs, in Rhyme, comp. by Lillian Morrison; illus. by Doris Lee (Crowell, 1958), 152pp. **C, I, A**

Law (340–349)

Voices in Court; A Treasury of the Bench, the Bar, and the Courtroom, ed. by William H. Davenport (Macmillan, 1958), 588pp. An anthology of writings about the law—essays, biographies, decisions, famous trials, and short stories. **I, A**

Essentials of American Business Law, by Reuben R. Rosenberg; 2d ed. (Gregg, 1955), 376pp. illus. Stresses the social and utilitarian values of the subject. **I, A**

Family Legal Adviser; a Clear, Reliable, and Up-to-Date Guide to Your Rights and Remedies Under the Law, ed. by Theodore R. Kupferman; rev. ed. (Greystone, 1957), 366pp. **A**

Handbook of Everyday Law, by Martin J. Ross (Harper, 1959), 308pp. index, 20-page glossary of legal terms. Points of law explained in nontechnical language and illustrated with specific cases. **I, A**

The Law, It's on Your Side, by Frank Denman (Macmillan, 1952), 74pp. The purposes and principles of law and the machinery of enforcement. **C, I**

The Mysterious Science of the Law, by Daniel J. Boorstin (Beacon, 1958), 257pp. Subtitle: An Essay on Blackstone's Commentaries, Showing How Blackstone, Employing 18th-Century Ideas of Science, Religion, and Philosophy, Made the Law at Once a Conservative and a Mysterious Science. **A**

Military Defense (355–359)

Air Force; a Pictorial History of American Airpower, by Martin Caidin in collaboration with the U.S.A.F. (Rinehart, 1957), 232pp. illus. A pictorial documentation of 50 years of the development of air power. **I, A**

Compact History of the United States Army, by Richard E. Dupuy; illus. by G. I. Walker (Hawthorn, 1956), 318pp. The Army from the Revolutionary War to the Korean conflict; the professional soldier, draftee, Guardsman, Reservist, and their women. **I**

Arms and Men; A Study in American Military History, by Walter Millis (Putnam, 1956), 382pp. Discussion of American military policy, its political and economic background, and the careers of American military leaders from colonial days to the present. **A**

So You're Going in the Army, by John L. Begley (Military Service, 1956), 171pp. illus. map. Advice to the prospective army recruit on how to put his home affairs in order, and a description of the induction process. **I**

Compact History of the United States Navy, by Fletcher Pratt; illus. by Louis Priscilla (Hawthorn, 1957), 347pp. Stories about the Navy, the ships, and the sailors, as well as the important naval engagements. **I, A**

Annapolis; the Life of a Midshipman, by John T. Engeman (Lothrop, 1956), 152pp. 250 photos. Daily routine from plebe through graduation. **C, I**

Complete Book of Veterans' Benefits, by Phyllis I. Rosenteur (Random, 1956), 127pp. illus. Information on both national and state benefits, with addresses of agencies and their regional offices. **A**

Story of The United States Marines, by George P. Hunt; illus. by J. Mazoujian (Random, 1951), 182pp. History of the Corps developed through stories of outstanding men and events. **C, I**

Political Science (320–329)

General

National Governments and International Relations, by Frank A. Magruder (Allyn, 1952), 664pp. illus. maps, bibliog. glossary. The politics and governments of 17 nations, Alaska, Hawaii, and Puerto Rico. **I, A**

Great Political Thinkers; Plato to the Present, ed. by William Ebenstein; 2d ed. (Rinehart, 1956), 940pp. Excerpts from the works of 41 philosophical or political figures. This ed. contains a chapter on "The Welfare State." **I, A**

You and Democracy, by Dorothy Gordon; illus. by Lois Fisher and Karl Murr (Dutton, 1951), 59pp. map. The meaning of democracy, and the privileges enjoyed under it. The various freedoms and rights are explained and illustrated. **C**

Ogg and Ray's Introduction to American Government, by William H. Young; 11th ed. (Appleton, 1956), 953pp. illus. A textbook stressing present-day problems of civil rights, labor unions, welfare, states' rights, and taxation. **I, A**

Grammar of American Politics; The National Government, by Wilfred E. Binkley and Malcolm C. Moos; 3rd ed. (Knopf, 1958), 806pp. An interpretation of, and commentary on, government and politics in the U.S. **I, A**

Communism

Communism in Our World, by John C. Caldwell (Day, 1956), 126pp. illus. map. What Communists believe; how people live in Communist countries; the Communist policy of world conquest; and the efforts of the free world to oppose that policy. **C, I**

What We Must Know About Communism, by Harry and Bonaro Overstreet (Norton, 1958), 348pp. A survey of Marxist principles, an examination of the Russian Revolution, present-day Communism, the foreign policy of the Soviet Union, and what these policies mean to the individual American. **I, A**

Roots of American Communism, by Theodore Draper (Viking, 1957), 498pp. illus. History of the party from its independent beginnings to its present status as a subsidiary of the Russian system. **I, A**

In the Shadow of Russia; Eastern Europe in Postwar World, by Nicholas Halasz (Ronald, 1959), 390pp. A survey of the past and recent fortunes of Russia's seven satellite countries; comments on both Russian and American foreign policy. **A**

Can Capitalism Compete? A Campaign for American Free Enterprise, by Raymond W. Miller (Ronald, 1959), 264pp. The uphill fight to sell American capitalism against the pressures of world Communism. **A**

Foreign Policies

Diplomatic History of the American People, by Thomas A. Bailey; 5th ed. (Appleton, 1955), xxxix, 969pp. illus. maps. The role of public opinion, from colonial times on, in developing foreign policies. **I, A**

The United States in World Affairs—1958, by Richard P. Stebbins (Harper, 1959), 479pp. The annual review by the Council on Foreign Relations. **A**

United States and Japan, by Edwin O. Reischauer; rev. ed. (Harvard, 1957), xxiv, 394pp. maps. Analysis of the various aspects of the life, philosophy, and government of the Japanese; their relations with the U.S.; reforms now in process. **I, A**

Minority Groups

One America; the History, Contributions, and Present Problems of Our Racial and National Minorities, ed. by Francis J. Brown and Joseph S. Roucek; 3rd ed. (Prentice, 1952), 764pp. illus. bibliog. The cultures, education, and activities of immigrant groups in the U.S. **I, A**

Race and Nationality in American Life, by Oscar Handlin (Little, 1957), 300pp. The origins of prejudice in the U.S. against various races, religions, and nationalities is explained by reference to historical documents and records. **I, A**

Immigration and the United States, ed. by Poyntz Tyler (Wilson, 1956), 201pp. A symposium of divergent viewpoints and divergent solutions to the problem of immigration. **I, A**

Passage to America; the Story of the Great Migrations, by Katherine B. Shippen (Harper, 1950), 211pp. The background situations that caused various groups to migrate here; the rise of Negro slavery in the U.S. **C**

They All Chose America, by Albert Q. Maisel (Nelson, 1957), 280pp. A series of articles, first published in the *Reader's Digest*, on the nationals of many countries who came to the U.S., and their descendants. **I, A**

Pictorial History of the Negro in America, by Langston Hughes and Milton Meltzer (Crown, 1956), 316pp. illus. maps. 1,000 photos, paintings, and cartoons illustrate the Negroes' life from 1619 to 1954. **C, I, A**

The Negro in the United States, by Edward F. Frazier; rev. ed. (Macmillan, 1957), xxxiii, 769pp. maps. A study of the Negro community, its institutions, and its interaction with other elements of American society. **A**

Political Parties

Modern Political Parties; Approaches to Comparative Politics, ed. by Sigmund Neumann (Univ. of Chicago, 1956), 460pp. A study of party systems in various nations, written by ten specialists. **A**

American Party System, by Charles E. Merriam; 4th ed. (Macmillan, 1949), 530pp. maps. Party composition, organization, the spoils system, bosses, nominating systems, and election machinery. **I, A**

American Political Parties; Their Natural History, by Wilfred E. Binkley; 3rd ed. (Knopf, 1958), 470pp. This ed. brings the account through the 1956 campaign. **I, A**

American Politics and the Party System, by Hugh A. Bone; 2d ed. (McGraw, 1955), 670pp. Analysis of basic factors in American politics, political interest groups, and the development and activities of parties, plus a comparison with European parties and a chapter on public opinion measurement and modern propaganda methods. **I, A**

Let's Go Into Politics, by R. E. Baldwin (Macmillan, 1952), 179pp. A former senator and governor gives specific advice to the citizen who wishes to enter politics—whom to see, how to campaign, the importance of local party leaders. **A**

United Nations

How the United Nations Works, by Thomas F. Galt; illus. by Ava Morgan; rev. ed. (Crowell, 1956), 247pp. The origin and operation of the U.N., and a guide to the building. **C**

The United Nations as a Political Institution, by H. G. Nicholas (Oxford, 1959), 248pp. The organization and day-to-day workings of the U.N. and its agencies. **I, A**

Workshops for the World; the Specialized Agencies of the United Nations, by Graham Beckel (Abelard, 1954), xxiii, 213pp. illus. map. The operation of 11 agencies of the U.N. in promoting international cooperation in the social and economic fields. **C, I**

Public Administration (350–354)

Federal Government

United States Government Organization Manual; rev. frequently (Govt. Ptg. Off.). A reference book on the organization and functions of the Federal departments and agencies, with names of top personnel. **I, A**

Your Rugged Constitution; How America's House of Freedom is Planned and Built, by Bruce A. and Esther B. Findlay; illus. by Richard Dawson; rev. ed. (Stanford, 1952), 282pp. maps. Each clause of the Constitution explained in nontechnical language. **C, I, A**

We Are the Government, by Mary Elting and Margaret Gossett; charts and pictures by Jeanne Bendick (Doubleday, 1945), 90pp. The workings of each department explained by picture and example. **C**

History of Presidential Elections, by Eugene H. Roseboom (Macmillan, 1957), 568pp. The developments in each administration that influenced the work of party conventions and determined the character and outcome of campaigns. **A**

The Man in the White House; His Powers and Duties, by Wilfred B. Binkley (Johns Hopkins, 1959), 310pp. The development of executive authority from Washington to Eisenhower. **I, A**

The President's Cabinet, by Richard F. Fenno, Jr. (Harvard, 1959), 327pp. The development of the cabinet, the interrelations of its members; the aid and the difficulties it gives the President. **I, A**

Marble Palace; the Supreme Court in American Life, by John P. Frank (Knopf, 1958), 301pp. The history of the Supreme Court, its importance and power; its relation to Congress and the President; its methods of operation. **I, A**

First Book of Congress, by Harold Coy; illus. by Helen Borten (Watts, 1956), 59pp. glossary. The structure of Congress: election machinery, duties, procedures, traditions, and relation to other parts of the government. **C**

Citadel; The Story of the United States Senate, by William S. White (Harper, 1957), 274pp. Portrait of the Senate as a cohesive working team and as a ranked society of small groups; national events in which the Senate played an important part. **I, A**

Story of the F.B.I., by the editors of *Look* Magazine, with an introduction by J. Edgar Hoover; rev. ed. (Dutton, 1954), 286pp. photos. Description of the training of G-men, and stories of important cases broken by the F.B.I. **I, A**

The Silent Investigators. . . , by John N. Makris (Dutton, 1959), 319pp. illus. The story of the U.S. Postal Inspection Service, which protects the mails from burglary and citizens from poison-pen and blackmail letters and fraudulent schemes. **C, I**

Six Against Crime; Treasury Agencies in Action, by Harry E. Neal (Messner, 1959), 192pp. photos. A former U.S. Secret Service assistant chief describes six law-enforcement agencies of the Treasury Department, with stories of hunting and capturing criminals. **C, I**

Complete Guide to U. S. Civil Service Jobs, by David R. Turner (Arco, 1957), 93pp. illus. map. A survey of Civil Service, with lists and descriptions of positions and advice on how to apply for them. **I, A**

Tall Timber; the Work, Machines, and Men in the U. S. Forest Service, by Carroll B. Colby (Coward, 1955), 48pp. photos, map. Typical events in the day of a Forest Service Ranger; the importance of National Forests in the nation's conservation program. **C, I**

Fish and Wildlife; the Story of the Work of the U. S. Fish and Wildlife Service, by Carroll B. Colby (Coward, 1955), 48pp. illus. map. The work of protecting and conserving the wild birds, animals, and fish of the U.S. **C, I, A**

Park Ranger; the Work, Thrills, and Equipment of the National Park Rangers, by Carroll B. Colby (Coward, 1955), 48pp. illus. The life of a ranger, who must be guide, surveyor, policeman, firefighter, and rescuer of wildlife and tourists. **C, I**

The Government and the Farmer, ed. by Walter M. Daniels (Wilson, 1956), 195pp. Various phases of government aid to farmers; suggested programs. Drawn mostly from materials published since 1951. **I, A**

State and Local Government

American State Government and Administration, by Austin F. Macdonald; 5th ed. (Crowell, 1955), 672pp. illus. Discussion of city, county, and state government, education, political parties, roads, taxation, etc. **I, A**

Behind the Silver Shield, by John J. Floherty (Lippincott, 1948), 195pp. illus. The story of the policeman, with emphasis on society's dependence on police protection, the necessity of crime prevention, and the fact that crime does not pay. **C**

Municipal Year Book; the Authoritative Resumé of Activities and Statistical Data of American Cities (Int'nat'l City Managers, annual), illus. Current problems of cities; trends by population groups. **I, A**

Troopers All; Stories of State Police, by John J. Floherty (Lippincott, 1954), 148pp. illus. History of the state police; dramatic incidents from their records; vocational opportunities. **C, I**

Ten Tall Texans, by Lee McGiffin; illus. by John A. Maxwell (Lothrop, 1956), 220pp. The story of the world's oldest mounted police force, the Texas Rangers, through the experiences of ten of them. **C, I**

Social Welfare (360–369)

Includes social work, societies, club work, and insurance

Development of Social Thought, by Emory S. Bogardus; 3rd ed. (Longmans, 1955), 660pp. Thought and thinkers from earliest ages and in every country, oriental and occidental. **A**

Robert's Rules of Order, by Henry M. Robert; rev. ed. (Scott, 1956), 326pp. Parliamentary rules as practiced by Congress; how to organize and conduct meetings, conventions, etc. **I, A**

Handbook for Group Leaders, by Ann C. Brown and Sally B. Geis (Woman's, 1952), 212pp. Suggestions on organizing women's clubs, initiating and accomplishing programs. **A**

101 Ideas for Clubs . . . , by Renée B. Stern; illus. by Douglas Anderson (Sterling, 1956), 254pp. illus. Suggestions for club names, insignia, colors, initiations; advice on meetings. **C, I**

Life Insurance, by Solomon S. Huebner and Kenneth Black, Jr.; 5th ed. (Appleton, 1958), xxv, 582pp. illus. The use of life insurance in the interests of personal, family, or business welfare. **A**

Property Insurance, by Solomon S. Huebner and Kenneth Black, Jr.; 4th ed. (Appleton, 1957), xxvi, 568pp. illus. Nontechnical presentation of the principles and practices involved and the various forms in use. **A**

You and Your Aging Parents, by Edith M. Stern and Mabel Ross (Wyn, 1952), 212pp. Suggestions on the best methods of caring for parents in varying degrees of helplessness. **A**

If You Adopt a Child, by Carl and Helen Doss (Holt, 1957), 368pp. Advice on whether to adopt a child and how to go about it; includes pertinent laws, and lists of agencies by states and religions. **A**

First Lady of the Seeing Eye, by Morris Frank and Blake Clark (Holt, 1957), 156pp. photos. The story of Buddy, the German shepherd, who helped blind Frank Morris to help himself and to found the Seeing Eye Service. **C, I, A**

TECHNOLOGY (620–699)

Includes agriculture, building construction, business and business methods, engineering, home economics, and industries

General

Includes inventions, tools, and miscellaneous occupations

Inventions and Their Management, by Alf K. Berle and L. S. De Camp (Van Nostrand, 1951), xxv, 742pp. illus. Information on patent law and the fundamentals of invention management. **A**

Understanding Science, by William H. Crouse; illus. by Jeanne Bendick; rev. ed. (McGraw, 1956), 192pp. illus. Explains the laws underlying activities and inventions in engines, aviation, electronics, etc. **C, I, A**

American Science and Invention, by Mitchell Wilson (Simon, 1954), 437pp. 1,200 illus. Subtitle: A Pictorial History; The Fabulous Story of How American Dreamers, Wizards, and Inspired Tinkerers Converted a Wilderness into the Wonder of the World. **C, I, A**

Everyday Machines and How They Work, by Herman Schneider; illus. by Jeanne Bendick (McGraw, 1950), 192pp. The workings of machines and appliances found in the home. **C**

Man and His Tools, by William A. Burns; illus. by Paula Hutchinson (McGraw, 1956), 158pp. How man first discovered the basic tools from which all our present-day tools are developed, and how he improved them throughout the ages. **C, I**

Tools in Your Life, by Irving Adler; illus. by Ruth Adler (Day, 1956), 128pp. illus. The development of tools from the stone hand-axe to the cyclotron. **C, I**

Boys' Book of Tools, by Raymond F. Yates (Harper, 1957), 173pp. illus. Introductory guide to basic tools used at home and school; selection of good tools and proper use of them. **C, I**

Let Erma Do It; The Full Story of Automation, by David O. Woodbury (Harcourt, 1956), 305pp. illus. A nontechnical explanation of the workings of automatic mechanisms. **I, A**

Guided Weapons, by Eric Burgess (Macmillan, 1957), 255pp. illus. map. Introduction to the basic concepts from which guided missiles have been developed. **A**

They Almost Made It, by Fred Reinfeld; illus. by Ava Morgan (Crowell, 1956), 198pp. A story of the forerunners of the great inventors whose inventions did not succeed, but who prepared the way for later inventors. **C, I**

Watch and Clock Making and Repairing, by W. J. Gazeley (Nostrand, 1953), 440pp. illus. Also covers the cleaning of clocks and watches; lists the causes of failure and poor time-keeping; includes instructions for the making of the special tools required. **I, A**

Bicycle Owner's Complete Handbook of Repair and Maintenance, by Steve Kraynick (Clymer, 1952), 128pp. illus. Includes advice on the selection of new and used bicycles. **C, I, A**

Small-Appliance Servicing, by P. T. Brockwell (McGraw, 1957), 189pp. illus. How to repair electric irons, toasters, mixers, and the like; how to set up and manage a small appliance repair shop. **A**

Agriculture (630–639)

Includes farming, gardening, and livestock and pets

General

Includes farming

Handbook of Food and Agriculture, ed. by Frederick C. Blanck (Reinhold, 1955), 1,039pp. 26 chapters, written by specialists, on soil and other plant requirements, and on the storage, preservation, processing, and packaging of meats, fish, grains, and vegetables. **A**

Soil; The Yearbook of Agriculture, 1957, by the U. S. Department of Agriculture (Govt. Ptg. Off., 1957), 784pp. illus. maps. 88 articles on the various phases of soil management. **A**

Weeds, by Walter C. L. Muenscher; 2d ed. (Macmillan, 1955), 560pp. illus. Guide to the identification and control of weeds in the U.S. and Canada. **I, A**

Trees; The 1949 Yearbook of Agriculture, U. S. Dept. of Agriculture (Govt. Ptg. Off., 1949), 944pp. illus. maps. Trees considered as they grow in yards, woodlots, and forests; their importance to man. **I, A**

Insects; The 1952 Yearbook of Agriculture, by U. S. Dept. of Agriculture (Govt. Ptg. Off., 1952), 952pp. illus. 72 col. plates. Information on insects as helpers and as destroyers; on the various means of control; on identification. **I, A**

Manual of Cultivated Plants Most Commonly Grown in Continental United States and Canada, by Liberty H. Bailey and the staff of the Bailey Hortorium; rev. ed. (Macmillan, 1949), 1,116pp. illus. Glossary of 1,000 terms. **I, A**

The Agricultural Regions of the United States, by Ladd Haystead and Gilbert C. Fite (Univ. of Oklahoma, 1955), 288pp. illus. photos, maps. Description of the various regions in terms of what can best be produced in each. **A**

American Oasis; The Land and Its Uses, by Edward C. Higbee (Knopf, 1957), 262pp. plates. Deals with the factors affecting farm land, such as its own make-up, the climate, and what is wanted from it; then considers the present use and misuse of land in various areas. **A**

From My Experience; The Pleasures and Miseries of Life on a Farm, by Louis Bromfield (Harper, 1955), 355pp. illus. The author describes his farms in Ohio and in Brazil. **I, A**

Gardening (635)

Taylor's Encyclopedia Of Gardening, Horticulture and Landscape Design, ed. by Norman Taylor; 3rd ed. (Am. Garden, 1957), 1,248pp. illus. Besides usual topics, this ed. contains maps of each state and province in the U.S. and Canada, showing climate, seasons, and soil conditions in each. **I, A**

Treasury of American Gardens, by James M. Fitch and F. F. Rockwell (Harper, 1956), 175pp. 150 illus. 100 col. photos. Geographical arrangement, includes Hawaii; planting diagrams and schedules for some of the entries. **I, A**

Improving Your Garden Through Soil Management, by Earl F. Downey (Crown, 1955), 250pp. illus. A nontechnical guide to soil testing and improvement. **I, A**

Gardener's Bug Book, by Cynthia Westcott; illus. by Eva Melady and J. E. Edmonson; 2d ed. (Am. Garden, 1956), 579pp. 36 col. plates. Description of common garden pests and control methods arranged alphabetically by the common names of insects. Host plants and their pests listed separately. **C, I, A**

The Grafter's Handbook, by Robert J. Garner; 2d ed. (Oxford, 1959), 260pp. 32 plates, 117 diagr. The various types of grafting, for both amateur and professional use. **I, A**

Pruning Manual, by Everett P. Christopher (Macmillan, 1954), xx, 320pp. illus. Also gives instructions on grafting and wound treatment. **I, A**

Gardens and Grounds That Take Care of Themselves, by Amelia L. Hill (Prentice, 1958), 281pp. diagr. photos. Considers grounds, lawns, trees and shrubs, flowers, and special projects. **A**

Guide to Home Landscaping, text and illus. by Donald J. Bushey (McGraw, 1956), 293pp. Advice to the small-property owner on selection of a home site, locating the buildings and driveways, grading, planting, and care. **A**

Plant Propagation in Pictures . . . by Montague Free (Am. Garden, 1957), 249pp. 350 photos, 11 drawings. Instruction in the various methods of increasing plants. **I, A**

The Book of Annuals, by Alfred C. Hottes; 6th ed. (Dodd, 1952), 184pp. illus. Descriptions of many plants, with instructions for planting and care. **I, A**

The Complete Book of Bulbs, by Frederick Rockwell and Esther Grayson (Doubleday, 1953), 352pp. illus. photos. 100 species suitable for outdoor and indoor cultivation. **I, A**

Geraniums, Pelargoniums, for Windows and Gardens, by Helen V. P. Wilson; illus. by Natalie H. Davis; rev. ed. (Barrows, 1957), 240pp. Describes many varieties of geraniums, with instructions on their culture both indoors and outdoors. **I, A**

ABC of Orchid Growing, by John V. Watkins; 3rd ed. (Prentice, 1956), 190pp. illus. Step-by-step instructions for cultivating orchids, with guide to materials and equipment needed. Glossary. **I, A**

Home Garden Book of Herbs and Spices, by Milo Miloradovich (Doubleday, 1952), 236pp. illus. Plants are arranged alphabetically, with description, uses, cultivation, and harvesting information. Glossary of common and scientific names. **A**

Nut Grower's Handbook, by Carroll D. Bush (Judd, 1953), 199pp. illus. Subtitle: A Practical Guide to the Successful Propagation, Planting, Cultivation, Harvesting, and Marketing of Nuts. **I, A**

Fragrance in the Garden, by Norman Taylor (Van Nostrand, 1953), 110pp. What plants to grow for fragrance in the garden, indoors, in sachets and perfumes. Instructions in plant perfume making. **I, A**

Fruit in the Garden, by Norman Taylor (Van Nostrand, 1954), 134pp. illus. How the weekend gardener can select, grow, and care for fruit trees in a limited area. **I, A**

Shady Gardens; How to Plan and Grow Them, by Emily S. Parcher (Prentice, 1955), 282pp. illus. Specific directions on filling shaded areas with flowers and foliage plants. **I, A**

Window-Box Gardening . . . , by Henry Teuscher (Macmillan, 1956), 180pp. illus. Subtitle: An Illustrated Guide for the Outdoor Culture of Plants in Boxes, Tubs, and Hanging Baskets. **I, A**

Your Garden in Town, by Ruth Marie Peters (Holt, 1957), 180pp. photos. How to grow what plants on a roof top, a window ledge, a doorstep, or in a hanging basket. **I, A**

Livestock and Pets (636)

Animal Diseases; The Yearbook of Agriculture, 1956, by the U.S. Dept. of Agriculture (Govt. Ptg. Off., 1956), 591pp. illus. maps. Information on the cause, nature, and prevention of common diseases of animals on American farms; bibliographies. **A**

Pets; A Complete Handbook on the Care, Understanding and Appreciation of All Kinds of Animal Pets, by Frances Chrystie (Little, 1953), 272pp. illus. Care of 41 animals, mostly domestic, but including a few wild ones. **I, A**

First Aid for Pets, by Leon F. Whitney (Vanguard, 1954), 191pp. illus. Help for cats, dogs, birds, and fishes; handling of a sick or injured animal. **I, A**

Modern Dog Encyclopedia, ed. by Henry P. Davis; 2d ed. (Stackpole, 1956), 626pp. illus. The history of dogs from prehistoric times; rules and regulations of the American Kennel Club. **I, A**

How to Raise a Dog in the City . . . in the Suburbs, by James R. Kinney with Ann Honeycutt; illus. by James Thurber; rev. ed. (Simon, 1953), 209pp. Humorous discussion on the choosing, care, and training of a dog. **C, I, A**

Complete Book of Cats, by Adie Suehsdorf; photos by Walter Chandoha (Random, 1956), 128pp. History and lore of all breeds of cats, ancient and modern; how to choose, feed, and train a kitten; how to treat cat ailments. **I, A**

How to Live with a Cat, by Margaret C. Gay; illus. by Roberta Macdonald; photos by Curtis M. Mayborn; rev. ed. (Simon, 1953), 267pp. Written by a pet-shop owner. Amusing illus. **C, I, A**

Care and Training of Home Cage Birds, by Bernard Poe (Putnam, 1953), 120pp. illus. Mostly about canaries. Bernard Poe is the pseudonym of the ornithologist, Leon A. Hausman. **I, A**

Practical Guide for Horse Owners, by Jack Widmer (Scribner, 1957), 162pp. illus. Instructions to the amateur on the care, training, buying, and breeding of horses; glossary. **I, A**

Complete Book of Horses, by Howard J. Lewis (Random, 1957), 128pp. illus. Facts about breed and color, plus stories and legends about many kinds of horses. **C, I**

Raising Small Animals for Pleasure and Profit, by Frank G. Ashbrook (Van Nostrand, 1951), 260pp. illus. Advice for the beginner on raising rabbits, poultry, fish, mink, and other animals for home or market. **I, A**

Fur Farming for Profit, by Frank G. Ashbrook (Judd, 1948), 429pp. illus. Advice to beginners on choosing a farm site, general management, prevention and treatment of diseases of different fur animals; marketing hints. **A**

The Longhorns, by James Dobie; illus. by Tom Lea (Little, 1941), xxiii, 388pp. photos. Stories about the cattle, cowboys, and stock ranges of the old West. **C, I, A**

Building Construction (690–699)

A World Full of Homes, by William A. Burns; illus. by Paula Hutchinson (McGraw, 1953), 120pp. The many ways in which man has sheltered himself from bad weather, and the homes he has built from grass, stone, brick, wood, and other materials from primitive times to the present. **C, I**

Woodworking Projects and Planning Guide, by K. T. Olsen (Bruce, 1955), 36pp. illus. Describes 23 projects, listing the necessary tools, and giving step-by-step procedures. **C, I**

Cabinetmaking and Millwork; Tools, Materials, Construction, Layout, by Alf A. Dahl and John D. Wilson; 2d ed. (Am. Tech. Soc., 1956), 235pp. illus. maps. **A**

Practical House Carpentry; Simplified Methods for Building, by John D. Wilson (McGraw, 1957), 360pp. illus. Step-by-step instructions. **I, A**

How to Build Cabins and Ranch Houses (Popular Science, 1952), 252pp. illus. diagr. Subtitle: Complete Directions and Plans for Interiors, Furniture, Landscaping, and Modern Improvements. **A**

Camps and Cottages; How to Build Them, by Charles D. White (Crowell, 1953), 280pp. plans. diagr. Includes guest houses and ranch houses. **I, A**

Concrete Block Construction for Home and Farm, by James R. Dalzell and Gilbert Townsend; contrib. to 2d ed., Edward Matzke (Am. Tech. Soc., 1957), 216pp. illus. Practical suggestions for the inexperienced. **A**

Bricklaying Skill and Practice, by James R. Dalzell and Gilbert Townsend; rev. ed. (Am. Tech. Soc., 1954), 195pp. illus. Practical information on all phases of brick masonry work. **I, A**

Business and Business Methods (650–659)

Dictionary of Business and Finance, by Donald T. Clark and Bert A. Gottfried (Crowell, 1957), 414pp. Vocabulary in all fields of business from accounting to warehousing. Appendixes give conversion and interest tables. **I, A**

American Business Dictionary, by Harold Lazarus (Philosophical Lib., 1957), 522pp. Definitions in all areas of business, from accounting through industrial psychology, taxation, and wholesaling. **I, A**

Modern Office Management, by Cleatice L. Littlefield and R. L. Peterson (Prentice, 1956), 562pp. illus. Tested company practices and techniques; case histories used to illustrate problems. **I, A**

Elements of Supervision, by William R. Spriegel and others; 2d ed. (Wiley, 1957), 349pp. illus. Basic fundamentals for handling personnel problems. **A**

A Business of Your Own; How to Select, Finance, and Start It Successfully, by Thomas P. Murphy (McGraw, 1956), 285pp. Choosing the right business for your aptitudes and qualifications; recognizing good and poor opportunities. **A**

How to Run Your Own Business and Make It Pay, by William R. Minrath (Van Nostrand, 1956), 323pp. illus. A guide to all phases of operation and management, with samples of forms and a list of trade directories. **A**

Accounting for Non-Accountants; Key to an Understanding of Accounting, by John N. Myer (N. Y. Univ., 1957), 235pp. illus. Emphasis is not on doing accounting, but on understanding how it is done and the significance of its results. **I, A**

How to Write Better Business Letters . . . , by Earle A. Buckley; 4th ed. (McGraw, 1957), 280pp. illus. Pointers on the various kinds of letters, and a chapter on business manners in letters. **I, A**

New Art of Selling, by Elmer G. Leterman (Harper, 1957), 280pp. Addressed especially to retail trade, service, and door-to-door salesmen, with specific accounts of sales in those fields. **I, A**

20th Century Typewriting, Complete Course, by David D. Lessenberry and others; 7th ed. (South-Western, 1957), 212pp. illus. **C, I, A**

Engineering (620–629)

Includes aeronautics, electronics, highway engineering, and naval engineering

General

Includes highway engineering

Engineering as a Career, by Ralph J. Smith (McGraw, 1956), 365pp. illus. Qualifications, duties, and responsibilities of engineers; pre-engineering education requirements. **I**

Engineering in Public Health, by Harold E. Babbitt (McGraw, 1952), 582pp. illus. The work of the public health engineer and the training required. **A**

American Highways Today, ed. by Poyntz Tyler (Wilson, 1957), 204pp. The planning and building of roads. **C, I**

Construction Ahead, by Henry Billings (Viking, 1951), 158pp. illus. maps. Survey of the growth of the U.S. highway system and of past and present road-construction techniques. **I**

Bridges, written and illus. by Henry Billings (Viking, 1956), 159pp. illus. maps. The development of the steel-arch, cantilever, and suspension types of bridges, and a history of bridge building in the U.S. **C, I**

The Canal Builders, by Robert Payne (Macmillan, 1959), 278pp. illus. maps. Besides stories of canal engineers, the book also shows the political, economic, and social developments which parallel the canals. **I, A**

Solar Energy, by Franklyn M. Branley; illus. by John Teppich (Crowell, 1957), 117pp. illus. Solar energy and how it can be harnessed. Descriptions of solar furnaces and other apparatus. **C, I, A**

Electronics (321.38)

Electricity and Electronics, by William B. Steinberg and Walter B. Ford (Am. Tech. Soc., 1957), 245pp. illus. A nontechnical explanation. **I, A**

Electronics for Young People, by Jeanne Bendick; rev. ed. (McGraw, 1955), 189pp. illus. The story of electrons and how they are harnessed, and of the many ways in which they help, protect, and entertain mankind. **C**

Electronics Made Easy, by Lothar Stern (Pop. Mechanics, 1956), 192pp. illus. Guide for the amateur in the construction of several instruments in the radio field. **I, A**

Boys' Second Book of Radio and Electronics, written and illus. by Alfred P. Morgan (Scribner, 1957), 276pp. illus. Detailed directions and working drawings for easily made radio and electronic apparatus; describes uranium mines and mining. **C, I**

Find a Career in Electronics, by Wallace West (Putnam, 1959), 160pp. photos. A survey for the would-be electronics specialist, with advice on how to seek vocational guidance, what courses to study in high school, and how to plan for the future. **C, I**

Your Telephone and How It Works, by Herman and Nina Schneider; illus. by Jeanne Bendick (McGraw, 1952), 96pp. Facts about the home telephone, plus ship-to-shore and train telephones, and walkie-talkies. **C, I**

Television Story, by John J. Floherty; rev. ed. (Lippincott, 1957), 160pp. 32 photos. An account of television from its origin and early experiments down to color TV. Glossary of TV terms. **C, I**

High Fidelity; a Practical Guide, by Charles Fowler (McGraw, 1956), 310pp. illus. Discussion of sound and sound reproduction, and the various parts of a high-fidelity system. **I, A**

How to Install and Service Intercommunication Systems, by Jack Darr (Rider, 1957), 151pp. illus. Components and circuits of both wired and wireless intercom systems. **I, A**

Transistor Circuit Handbook . . . , by Louis E. Garner (Coyne, 1956), 410pp. illus. Subtitle: A Practical Reference Book Covering Basic Circuits, Practical Applications, and Data on Uses for Transistors. **I, A**

Profitable Radio Troubleshooting; a Professional Guide to the Technical and Business Methods of Operating a Radio-TV Service Business, by William Marcus and Alex Levy (McGraw, 1956), 330pp. illus. **I, A**

Aeronautics (629.13)

Aviation from the Ground Up, by John J. Floherty; rev. ed. (Lippincott, 1957), 160pp. 32 photos. Discussion of various types of aircraft, and of career opportunities in aviation. **C, I**

Wider Than the Sky, by Charles M. Daugherty (Harcourt, 1958), 151pp. photos. Discussion of air and space, the history of aeronautics, and the job opportunities in this field. **C, I**

How Airplanes Are Made, by David Coxe Cooke (Dodd, 1956), 72pp. illus. photos. The designing, making, and testing of many types of airplanes. **C, I**

True Book of Airports and Airplanes, by John B. Lewellen; illus. by Richard Gates (Childrens Press, 1956), 46pp. **C**

Ships in the Sky; the Story of the Great Dirigibles, by John Toland (Holt, 1957), 352pp. photos. History of balloons and dirigibles and of the men connected with them. **I, A**

Helicopter Book, by Henry B. Lent (Macmillan, 1956), 144pp. photos. The story of helicopters and the men who build and fly them; examples of helicopters at work. **C, I**

The World's Fighting Planes, by William Green and Gerald Pollinger; 2d ed. (Hanover, 1957), 240pp. illus. Frequently rev. to include the latest aircraft advances. **C, I, A**

Rockets, Missiles, and Space Travel, by Willy Ley; rev. ed. (Viking, 1959), 528pp. photos. Nontechnical account of rocket development and space-travel prospects, with data on man-made satellites. Frequently revised. **I, A**

Space Flight; Satellites, Space Ships, Space Stations, and Space Travel Explained, by Carsbie C. Adams and others (McGraw, 1958), 373pp. illus. By the president of the National Research and Development Corp. **I, A**

Complete Book of Space Travel, by Albro T. Gaul; illus. by Virgil Finlay and Sam Moskowitz (World, 1956), 159pp. How a space ship must be built and navigated, and the difficulties to be expected. Portfolio of early space-ship pictures, 1638–1929. **C, I**

Guide to Rockets, Missiles, and Satellites, by Homer E. Newell, Jr. (McGraw, 1958), 54pp. illus. Dr. Newell, of the Vanguard program of the U.S. Naval Research Laboratory, explains the development of rockets and missiles, with photos and diagrams for easy identification. **C, I**

Earth Satellites, by Patrick A. Moore; illus. by Irving Geis (Norton, 1956), 157pp. illus. maps. The satellite program as it affects science, politics, and the future of man. **I, A**

Vanguard! The Story of the First Man-Made Satellite, by Martin Caidin (Dutton, 1957), 288pp. illus. maps. The construction and operation of the satellite, the research behind it, the knowledge to be gained from it. **I, A**

Model Planes for Beginners, written and illus. by Horace H. Gilmore; new ed. (Harcourt, 1957), 96pp. illus. How a plane flies; how to identify planes; how to make model planes. **C**

Building and Flying Scale-Model Aircraft, by Walter A. Musciano (McBride, 1953), 174pp. illus. diagr. Manual for both beginners and advanced modelers. Describes tools and equipment. **C, I, A**

Naval Engineering (623)

First Book of Submarines, by Joseph B. Icenhower; illus. by Mildred Waltrip (Watts, 1957), 60pp. Story of submarine invention, operation, and warfare. **C**

From Submarines to Satellites; Science in Our Armed Forces, by Margaret Hyde (McGraw, 1958), 106pp. illus. A vocational guide book, describing the scientific achievements of the military forces, and the opportunity for training in the various branches. **I**

Nautilus 90 North, by William R. Anderson with Clay Blair, Jr. (World, 1959), 251pp. photos. An account of the voyage from the Pacific to the Atlantic under the polar ice pack in the nuclear submarine *Nautilus*, told by its skipper. **I, A**

Home Economics (640–649)

Includes child care, clothes and textiles, etiquette, food, home planning and remodeling, and interior decoration and furnishing

General

America's Homemaking Book, by Marguerite Dodd; illus. by Sally Snow (Scribner, 1957), 342pp. Deals with the major topics: home building or buying, equipment, maintenance, and safety. **I, A**

Housekeeping after Office Hours; A Homemaking Guide for the Working Woman, by Charlotte Adams (Harper, 1953), 210pp. illus. How to plan cooking and cleaning, and what mechanical aids will speed housework. **A**

How To Make Your Budget Balance, by Helen Fowle and Edward C. Harwood; 10th ed. (Arco, 1955), 128pp. illus. An American Institute for Economic Research publication. Appraising the family's spending pattern. **A**

How to Clean Everything, by Alma C. Moore (Simon, 1952), 238pp. An encyclopedia of what to use and how to use it. **I, A**

The Home Owner's Complete Outdoor Handbook, by Emanuele Stieri (Prentice, 1952), 578pp. illus. maps. Discusses landscaping; building small structures and outdoor furniture; raising bees, chickens, pigeons, and rabbits; gardening. **I, A**

Child Care (649)

Our Children Today; A Guide to Their Needs from

Infancy to Adolescence, ed. by Sidonie M. Gruenberg and the staff of The Child Study Association of America (Viking, 1952), 366pp. Articles on the changing patterns of family living. **A**

Healthy Babies; a Complete Handbook for Modern Mothers, by Josephine H. Kenyon and Ruth K. Russell; 5th ed. rev. (Little, 1951), 317pp. The care, health, feeding, and training of children from birth to the age of three. **A**

The Baby-Sitter's Guide, by Mary Moore (Crowell, 1953), 120pp. illus. Suggestions on how to entertain children of different ages, serve meals, deal with emergencies, and get the children to sleep. **I, A**

Your Child's Teeth; a Guide for Parents, by Edgar S. Bacon (Dutton, 1957), 124pp. illus. Handbook on teething, home care and remedies, proper diet, when to seek professional care. **A**

Parents' Privilege; How, When, and What to Tell Your Child about Sex, by Marion O. Lerrigo and Helen Southard in consultation with Milton J. E. Senn. (Dutton, 1956), 64pp. illus. bibliog. Discusses physiological facts and suggests ways of presenting them to the child at various stages of development. **A**

What's Happening to Me? Sex Education for the Teen-ager, by Marion O. Lerrigo and Helen Southard in consultation with Milton J. E. Senn (Dutton, 1956), 63pp. illus. A simple explanation of the physical and emotional changes of adolescence. **I**

(See also *Medical Sciences, Child Health.*)

Clothes, Textiles, and Personal Appearance (646)

Fashion Dictionary; Fabric, Sewing, and Dress as Expressed in the Language of Fashion, by Mary Picken; editorial assoc., Claire Valentine (Funk, 1957), 397pp. illus. More than 10,000 fabric, style, color, and trade names defined, described, and pronounced. **I, A**

McCall's New Complete Book of Dressmaking, ed. by Marion Corey; new ed. (Greystone, 1957), 256pp. illus. A guide for making clothes for the entire family, including selection of becoming designs, colors, and materials. **I, A**

Man Is a Weaver, by Elizabeth C. Baity; illus. by C. B. Falls (Viking, 1942), 334pp. photos. bibliog. glossary, index. The story of cloth, telling the many ways in which it has been made, dyed, and used. **I**

Miracle Fabrics, by Ellsworth Newcomb and Hugh Kenny; illus. by Ava Morgan (Putnam, 1957), 160pp. Story of man's search for the perfect fabric, from natural fibers to modern synthetic fabrics. **C, I**

What People Wore, written and illus. by Douglas Gorsline (Viking, 1952), 266pp. Subtitle: A Visual History of Dress from Ancient Times to Twentieth Century America. **C, I, A**

Costumes and Styles, by Henny H. Hansen (Dutton, 1956), 160pp. col. plates. 685 examples of historic costumes in color. **C, I, A**

A Pageant of Hats, Ancient and Modern, by Ruth E. Kilgour (McBride, 1958), 389pp. 150 photos. The history, folklore, and special significance of hats from many countries and ages. **I, A**

Beauty Is Not an Age, by Eleanor Nash (Harper, 1953), 225pp. Advice on how to be attractive. **A**

How You Look and Dress, by Byrta Carson; 3rd ed. (McGraw, 1959), 400pp. 430 illus. A high-school homemaking teacher gives information on the new pattern sizes, new short-cut methods of sewing, and new textiles, as well as suggestions for buying clothes, and for total appearance. **I**

Etiquette (395)

Complete Book of Etiquette; A Guide to Gracious Living, by Amy Vanderbilt; illus. by Fred McCarroll and others; rev. ed. (Doubleday, 1958), 700pp. Correct procedure for all occasions; travel etiquette; teaching "manners" to children. **I, A**

Modern Manners; Etiquette for All Occasions, by Carolyn H. Shaw (Dutton, 1958), 368pp. illus. Correct procedures, from table manners and introducing your date, to protocol for formal dinners. **I, A**

Manners Made Easy, by Mary Beery; 2d ed. (McGraw, 1954), 333pp. 146 illus. Social usage, conduct, and poise for teen-agers. **C, I**

Good Housekeeping's Complete Wedding Guide, ed. by Elizabeth S. Weston; illus. by George Wiggins; floral decorations by Ann Haga (Hanover, 1957), 255pp. Guide to the etiquette of simple or elaborate weddings, from showers to wedding music. **A**

Art of Dating, by Evelyn M. Duvall and Joy D. Johnson (Y.M.C.A., 1958), 254pp. illus. Discusses dating procedures and etiquette; when to start, whom to date, the cost of dating, etc. **C, I**

Food (641)

First Book of Food, written and illus. by Ida Scheib (Watts, 1956), 65pp. How food is procured, processed, and preserved in the modern world. **C**

New Basic Cookbook, by Marjorie Heseltine and Ula M. Dow; rev. ed. (Houghton, 1957), 718pp. 96 photos. This revision includes the latest in modern appliances, foods, and their preparation. **I, A**

Farm Journal's Country Cookbook, ed. by Nell B. Nichols (Doubleday, 1959), 464pp. 32 col. plates. Over 100 recipes from all sections of the U.S. **I, A**

The Cokesbury Dinner and Banquet Book, by Clyde Maguire (Abingdon, 1953), 153pp. illus. 23 plans for club or church dinners, with menus and entertainment suggestions. **I, A**

Holiday Candy and Cookie Cookbook, by Paul V. De Gros (Arco, 1956), 144pp. illus. Step-by-step instructions for basic recipes and special-occasion cooking. **I, A**

Old Time Pickling and Spicing Recipes, by Florence R. Brobeck (Barrows, 1953), 126pp. illus. Small-quantity recipes for butters, pickles, relishes, vinegars, spiced fruits, and vegetables. **I, A**

Low-Fat Cookery, by Evelyn S. Stead and Gloria K. Warren; illus. by Frank Sieminsky (McGraw, 1956), 184pp. Foods to combat overweight, heart disease, and diabetes. **A**

The Low Sodium Cook Book, by Alma S. Payne and Dorothy Callahan (Little, 1953), 477pp. Subtitle: How to Prepare Tasteful Meals for the Low Salt Diet, Including Suggestions for the Low Cholesterol and Low Fat Diet. **A**

Home Planning and Remodeling (643–644)

Carpentry for Beginners, ed. by Charles Hayward (Lippincott, 1951), 200pp. illus. Subtitle: How to Use Tools; Basic Joints; Workshop Practice; Designs for Things to Make. **I, A**

First Aid for the Ailing House, by Roger C. Whitman; 5th ed. (McGraw, 1958), 427pp. illus. Advice on all phases of care of a home—painting, cleaning, repairing, safety precautions. **I, A**

Cabinets, Bookcases, and Wall Shelves, ed. by Milton J. Gunerman (Home Craftsman, 1950), 126pp. diagr. photos. Subtitle: How to Build all Types of Cabinets, Shelving, and Storage Facilities for the Modern Home. **I, A**

How to Finish Your Attic and Basement Yourself, by August Lockwood and Norman Stanton (Barrows, 1953), 279pp. illus. How to select tools, work out a floor plan, buy supplies, lay floors, build cupboards and closets, and finish ceilings. **A**

Family Handyman Magazine's Painting and Redecorating Book, (Harper, 1956), 128pp. illus. How to choose the best paint for your purpose; how to prepare the surface properly; how to apply the paint. **A**

Set Ceramic Tile Yourself, by Nicholas M. Raskhodoff (Van Nostrand, 1955), 176pp. illus. A guide for the inexperienced; describes the newly developed "thin-bed" technique. **A**

Easy-to-Make Outdoor Play Equipment, by Reginald

R. Hawkins (Macmillan, 1957), 99pp. illus. Detailed instructions for making 40 varied pieces, with simple hand tools, and by the amateur carpenter. **A**

Tree Houses, by Royal B. Wills; illus. by the author and Charles H. Crombie (Houghton, 1957), 67pp. Plans for constructing two safe and habitable basic tree houses. **C, I**

Machinery Around Your Country Home, by Herbert L. Nichols; illus. by Helen Schwagerman (North Castle, 1957), 407pp. illus. maps. How to buy and use outdoor machinery. **I, A**

Interior Decoration and Furnishing (645, 747)

Better Homes and Gardens Decorating Book (Meredith, 1956), 431pp. illus. Many ideas on furniture arrangement, color schemes, and decoration, in a loose-leaf binder. **I, A**

Book of Furniture and Decoration; Period and Modern, by Joseph Aronson (Crown, 1952), 242pp. 214 plates. A history of interiors; discussion of the elements of decoration and ways of using them to fit individual desires in each room of the house. **A**

Field Guide to Early American Furniture, by T. H. Ormsbee (Little, 1951), 464pp. illus. Information on the ten most important forms made before 1850, plus chapters on hardware and furniture woods. **A**

Standard Book of American Antique Furniture, by Edgar G. Miller, Jr. (Greystone, 1950), 856pp. illus. Chairs, tables, and other pieces from colonial days through 1840. **A**

How to Mend China and Bric-a-Brac, by Paul St. Gaudens and Arthur Jackson (Branford, 1953), 131pp. illus. Methods and tools used for repairing china, marble, ivory, plastics, leather, and dolls. **I, A**

Bonsai; Miniature Trees, by Claude Chidamian; illus. by Shirlea Hatcher (Van Nostrand, 1955), 96pp. Dwarf shrubs and plants are also discussed. **I, A**

Art of Drying Plants and Flowers, by Mabel Squires (Barrows, 1958), 258pp. illus. Methods for drying plants, flowers, and fruits, and suggestions on their arrangement. **I, A**

The Art of Driftwood and Dried Arrangements, by Tatsuo Ishimoto (Crown, 1951), 143pp. illus. photos. Suggestions for making decorative groups from driftwood, cones, stones, dried plants, and figurines. **I, A**

Decorating with Pods and Cones, by Eleanor Van Rensselaer, with photos by Blair Stapp (Van Nostrand, 1957), 179pp. How to make attractive wall decorations, corsages, tiny trees, etc. **I, A**

Industries (670–689)

Includes automobiles, boats and shipping, fishing, mining and oil, publishing, and railroads

General

Includes fishing and publishing

Public Utilities in American Capitalism, by Martin G. Glaeser (Macmillan, 1957), 624pp. diagr. charts. Deals with government control of utilities and transport industries, especially the administrative aspects, from a point of view favoring more government control. **A**

Marvels of Industrial Science, by Burr W. Leyson (Dutton, 1955), 189pp. illus. The invention and manufacture of synthetic fibers, cellulose derivatives, glass silicones, and allied materials. **I, A**

Story of Standards, by John Perry (Funk, 1955), 271pp. The development and use of standards, and their importance in science, manufacture, and everyday life. **I, A**

Great Heritage, by Katherine B. Shippen; illus. by C. B. Falls (Viking, 1947), 230pp. Description of American resources and industries from the early settlements to now. **C**

Miracle in Motion; the Story of America's Industry, by Katherine B. Shippen (Harper, 1955), 150pp. Three centuries of American industry; the introduction of machines into farm and home life; the growth of corporations and government intervention. **C, I**

17 Million Jobs; The Story of Industry in Action, by John Perry (McGraw, 1958), 236pp. charts. A picture of industry today and the career opportunities it offers. **I**

Iron and Steel Today, by John Dearden; 2d ed. (Oxford, 1956), 271pp. illus. A survey of the manufacturing processes. **A**

Trees and Test Tubes, by Charles M. Wilson (Holt, 1943), 352pp. illus. History of the rubber industry. **I, A**

The Story of Paper Making, by Edwin Sutermeister (Warren, 1954), 209pp. A detailed, nontechnical account of the processes of converting wood into paper. **I, A**

The Story of Glass, by Freda Diamond (Harcourt, 1953), 246pp. illus. Characteristics, uses, and manufacture of glass. **I, A**

Fur, by Max Bachrach; 3rd ed. (Prentice, 1953), 660pp. The sources and characteristics of modern furs, and preparation for use. **A**

Meat from Ranch to Table, written and illus. by Walter Buehr (Morrow, 1956), 95pp. maps. The meat industry in the U.S.; the farmers, cowboys, commission men, and butchers who raise and market meat animals; our changing eating habits. **C**

World Sea Fisheries, by Robert Morgan (Methuen, 1956), 307pp. illus. Describes the fishing industries and fishing and processing methods. **I, A**

Of Whales and Men, by Robert B. Robertson (Knopf, 1954), 299pp. illus. Story of an eight-month voyage to the Antarctic on a modern whaling vessel, told by the ship's doctor. **I, A**

Let's Take a Trip to a Fishery, by Sarah R. Riedman (Abelard, 1956), 127pp. illus. The history of the fishing industry, the methods of catching different species, and the operation of processing plants. **C**

Man Under Water, by Henry Billings (Viking, 1954), 189pp. illus. Tells how divers work, and the dangers they face, and of the different kinds of diving. **C, I**

Men at Work in New England, by Henry B. Lent (Putnam, 1956), 130pp. illus. An account of the processes in making 23 major New England products. **C**

What Happens in Book Publishing, ed. by Chandler B. Grannis (Columbia Univ., 1957), 414pp. Book-industry leaders and experts describe the process of publishing a book. **A**

Life of the Book, by Hellmut Lehmann-Haupt; illus. by Fritz Kredel (Abelard, 1957), 240pp. Subtitle: How the Book Is Written, Published, Printed, Sold, and Read. **I**

Mining and Oil Industries

Mining Around the World; Stories of Mines, Minerals, and Men, by June M. Metcalfe (Oxford, 1956), 123pp. illus. **I, A**

Underground Riches; the Story of Mining, written and illus. by Walter Buehr (Morrow, 1958), 95pp. illus. Minerals and their formation; the mining of gold, coal, and iron. **C**

Romance of Mining, by T. A. Rickard (Macmillan, 1947), 450pp. illus. Stories about the discovery of famous mines. **I, A**

Diamond; the Spectacular Story of Earth's Rarest Treasure and Man's Greatest Greed, by Emily Hahn (Doubleday, 1956), 314pp. map. History of South African diamond mining, diamond cutting and marketing, artificial diamonds. **I, A**

Oil; Today's Black Magic, written and illus. by Walter Buehr (Morrow, 1957), 96pp. maps. The story of oil, including where it is found, how the drilling is done, and dramatic events in the history of the industry. **C**

The Oil Century, From the Drake Well to the Conservation Era, by Joseph S. Clark (Univ. of Oklahoma, 1958), 280pp. illus. How petroleum has transformed American life in the past 100 years. **I, A**

The Greatest Gamblers; the Epic of American Oil Exploration, by Ruth S. Knowles (McGraw, 1959), 346pp. illus. History of the search for oil, with emphasis on the searchers; the oil industry's effect on community. and nation. **I, A**

The Great Oildorado; the Gaudy and Turbulent Years of the First Oil Rush; Pennsylvania, 1859–1880, by Hildegarde Dolson (Random, 1959), 300pp. illus. Anecdotes about Titusville, the identification of "Seneca oil," the difficulties in sinking the first well; the effects of the discovery on the people. **I, A**

Transportation—Automobile, Boat, and Rail

Economics of Transportation, by David P. Locklin; 4th ed. (Irwin, 1954), 916pp. A textbook dealing with all forms of transporation, including gas and oil pipelines, but with emphasis on railroads. **A**

Wheels Across America; a Pictorial Cavalcade Illustrating the Early Development of Vehicular Transportation, by Clarence P. Hornung (Barnes, 1959), 341pp. 1,100 illus. From the earliest stagecoach to about 1910, after the appearance of the Model T Ford. **C, I, A**

Ships and Life Afloat; From Galley to Turbine, written and illus. by Walter Buehr (Scribner, 1953), 116pp. maps. The building and operation of a ship; life aboard as seaman and as passenger; the different kinds of ships. **C**

All About Ships and Shipping, ed. by Edwin P. Harnack; 9th ed. (Faber, 1952), 647pp. The construction and operation of naval and merchant ships. **A**

Merchant Ships; A Pictorial Study, by John H. La Dage (Cornell Maritime, 1955), 481pp. Pictures and descriptions of many ships. **I, A**

Superliner S.S. "United States," written and illus. by Henry Billings (Viking, 1953), 128pp. maps. Describes the ship in detail and the daily work and events on a typical voyage. **C, I**

First Boat; How to Pick It and Use it for Fun Afloat, written and illus. by Carroll B. Colby (Coward, 1956), 48pp. illus. How to construct, operate, and service rowboats, canoes, sailboats, and outboard motors; sailing and safety rules. **C**

Great Canals, by T. C. Bridges (Nelson, 1936), 91pp. illus. Brief histories of the Panama, Suez, Kiel, and other canals. **I, A**

Railroading Around the World, by S. K. Farrington, Jr. (Coward, 1955), 230pp. photos. Pictures and descriptions. **I, A**

Railroads Today and Yesterday, written and illus. by Walter Buehr (Putnam, 1958), 72pp. Development of American railroads from their beginning to the use of electronic automation. **C**

Hear the Trains Blow, by Lucius Beebe and C. M. Clegg (Dutton, 1952), 407pp. 860 illus. Subtitle: A Pictorial Epic of America in the Railroad Age. Many reproductions of old prints and illustrations. **I, A**

Railroads of the Hour, by S. K. Farrington, Jr. (Coward, 1958), 333pp. 161 photos. Describes recent inventions and innovations for trains, tracks, and yards of American railroads. **A**

How to Build Model Railroads and Equipment, by Barton K. Davis (Crown, 1956), 190pp. illus. History of American railroads and model railroading; detailed descriptions for building; lists of tools and materials required. **I, A**

Trolley Car Treasury; a Century of American Street Cars—Horsecars, Cable Cars, Interurbans, and Trolleys, by Frank Rowsome; tech. ed., Stephen D. Maguire (McGraw, 1956), 200pp. illus. map. Pictures, anecdotes, verses, cartoons, and about 300 photos. No index. **C, I, A**

How Automobiles are Made, by David C. Cooke (Dodd, 1957), 64pp. illus. **C**

The Early Days of Automobiles, by Elizabeth Janeway; illus. by Hertha Depper (Random, 1956), 192pp. Automobiles in the U.S. and Europe, with emphasis on the difficulties encountered in driving the early cars. **C, I, A**

Famous Old Cars, by Hank Bowman (Arco, 1958), 96pp. illus. Stories and pictures about our earliest automobiles, their makers, and the men who drove them. **C, I**

The Indianapolis 500; The Story of the Motor Speedway, by Brock W. Yates (Harper, 1956), 147pp. illus. Besides the races themselves, the book covers changes in motor-car construction, and the qualities of a racing driver. **C, I**

Sport and Racing Cars, by Raymond F. and Brock W. Yates (Harper, 1954), 116pp. illus. photos. Compares American and European sport cars; describes aims and work of National Hot Rod Assn. Glossary. **I, A**

How to Drive . . . , by the American Automobile Association (The Assn., 1957), 122pp. illus., maps. Subtitle: . . . Ways to Save Money, Increase Motoring Enjoyment, Stay Accident Free . . . **I, A**

Famous Subways and Tunnels of the World, by Edward and Muriel White (Random, 1953), 97pp. Story of the digging and building of subways and other tunnels. **I, A**

Atlas of the World

An Introduction to the Gazetteer-Index and Maps

The following pages contain two listings—one including the major divisions of the world, and the other the major cities—and an atlas of easy-to-read full-color maps of every continent and country in the world. Together these constitute a basic reference collection, a guide to headline events, a travel aid, and an invaluable source of information for students.

The Atlas provides accurate, up-to-date information. International relationships are easily seen on the maps of the continents and regions, enabling the reader to locate and understand the political connections between such areas as Central Europe, Eastern Asia, and the Near East. A polar-projection chart indicates the strategic importance of the Arctic regions by showing the proximity of North America and Asia via polar routes. Land relief is emphasized on the special physical maps, enabling the layman and the student to determine the land formation at a glance.

The inclusion of railroads provides valuable assistance in plotting a trip itinerary. The relative size of cities is indicated by type size: large, bold type for the largest cities, medium type for the cities of next importance, and small type for the smaller cities and towns.

Each map is compiled on the projection which gives the truest picture for that particular area, thus eliminating distortion as much as is possible on a flat map. Each map also has a scale of miles.

The atlas as a whole will answer practical, everyday geographical questions that arise in business, travel, and study.

There are two maps for each of the states of the U.S. accompanying the article on each state in addition to the maps in the Atlas. The first, a locational map, shows the state's position in relation to the surrounding area. The second locates major cities, rivers, and national parks, and also shows the products and natural resources of the state.

The Gazetteer-Index of the World lists grand divisions, countries, states, and other political divisions. For the reader's convenience, two references are given —one to the map on which the area in question is best shown, and one to the volume of the encyclopedia that carries information on it. If the area is discussed in an article under its own heading, the listing gives the number of the volume where it can be found in alphabetical order. If the area is discussed in an article with a different heading, however, the volume number and the title of the article in which the subject is discussed are given in columns two and three. The fourth column lists the capital, seat of government, or chief town of each gazetteer entry. In the Map Title column is given the title of the map plate on which it appears, and the Map Plate column refers to the number of the map. In the Location Reference column is given the index reference, indicating the square within which the area lies; the square is formed by the lines of latitude and longitude identified by the coordinates; *i.e.,* the marginal letters and numbers.

It will be noted that the spelling of some names in the index listings and on the maps differs from that in the text articles. These variations occur because the map spellings reflect the scientific geographer's use of local spellings, while the text articles are written from the reader's point of view, using the popular or conventional English spellings. For example, on the map of Italy the capital is spelled Roma, while the text article uses the popular spelling, Rome.

In the case of nonself-governing regions, the country of administration is indicated by abbreviations in parentheses.

The Index to Cities of the World lists the principal cities and towns that appear on the maps in the Atlas. The entries are identified and located by the same system of plate number and index reference that is used for the Gazetteer-Index. Alternate names or variations in spelling are given in parentheses after the entry. An asterisk indicates a capital city. Each of the more important cities and towns is covered in a text article under its own name, in alphabetical order, or in the article on the political division of which it is a part.

Gazetteer-Index of the World

This alphabetical list of grand divisions, countries, states, and other political divisions gives the following information: (1) the text volume which contains a separate article or a discussion in another specified article; (2) the capital, seat of government, or chief town; (3) the title and number of the map plate on which each is found on the largest scale; and (4) the index reference listing the square on the map in which it is located. The country administering nonindependent areas is indicated by abbreviations in parentheses.

ABBREVIATIONS

Afgh. = Afghanistan
Alb. = Albania
Alg. = Algeria
Arg. = Argentina
Aus. = Austria
Aust. = Australia
Belg. = Belgium or Belgian
Br. = British Commonwealth of Nations
Bol. = Bolivia
Braz. = Brazil
Bul. = Bulgaria
Can. Is. = Canary Islands
Col. = Colombia
C. of G.H. = Cape of Good Hope
C.R. = Costa Rica
Czech. = Czechoslovakia
Den. or Dan. = Denmark or Danish
Dom. Rep. = Dominican Republic
E. = East
Ecu. = Ecuador
El Sal. = El Salvador
Eng. = England
Fed. of Rhod. & Nyas. = Federation of Rhodesia and Nyasaland
Fin. = Finland
Fr. = France or French
Ger. = Germany
Gibr. = Gibraltar
Gr. = Greece
Guat. = Guatemala
Hond. = Honduras
Hung. = Hungary
I. = Island
Is. = Islands
Ice. = Iceland
Indon. = Indonesia
It. = Italy
Jam. = Jamaica
Jap. = Japan
Mada. = Madagascar
Mal. Fed. = Malay Federation
Mand. = Mandate
Mart. = Martinique
Mex. = Mexico
Mor. = Morocco
Moz. = Mozambique
N. = North
N. Bor. = North Borneo
N. Cal. = New Caledonia
Neth. = Netherlands
Neth. Ant. = Netherlands Antilles
Nfld. = Newfoundland
Nicar. = Nicaragua
Nig. = Nigeria
No. Ire. = North Ireland
Nor. = Norway
N.S.W. = New South Wales
N.Z. = New Zealand
O.F.S. = Orange Free State
Pak. = Pakistan
Pan. = Panama
Para. = Paraguay
pen. = peninsula
P.I. = Philippine Islands
Pol. = Poland
Port. = Portugal or Portuguese
P.R. = Puerto Rico
Queen. = Queensland
Rep. = Republic
Rum. = Rumania
Sara. = Sarawak
Scot. = Scotland
So. = South
Soc. Is. = Society Islands
Sol. Is. Prot. = Solomon Islands Protectorate
Som. Prot. = Somaliland Prot.
Sp. = Spain or Spanish
S.S.R. = Soviet Socialist Republic
Sur. = Surinam
Swed. = Sweden
Switz. = Switzerland
Tang. Terr. = Tanganyika Territory
Tas. = Tasmania
Terr. N.G. = Territory of New Guinea
Thai. = Thailand
Transv. = Transvaal
Trust. = Trust Territory
Tun. = Tunisia
Turk. = Turkey
U.A.R. = United Arab Republic
U. of So. Africa = Union of South Africa
Uru. = Uruguay
U.S. = United States
U.S. Adm. = U.S. Administration
U.S.S.R. = Union of Soviet Socialist Republics
Venez. = Venezuela
W. = West
Yugo. = Yugoslavia

Country (In Map)	Article in Volume	Discussed in Article	Capital or Chief Town	Map Title	Map Plate	Location Reference
Aden Colony (Br.)	I	(Aden)	Aden	The Near East	54	E7
Aden Protectorate (Br.)	I	(Aden)	Aden	The Near East	54	E7
Afghanistan	I		Kabul	The Near East	55	M3
Africa	I		.....	Africa	61	—
Alabama, U.S.	I		Montgomery	United States	11	M6

GAZETTEER-INDEX OF THE WORLD

Country (In Map)	Article in Volume	Discussed in Article	Capital or Chief Town	Map Title	Map Plate	Location Reference
Alaska, U.S.	I		Juneau	Alaska	3	—
Albania	I		Tirana (Tiranë)	Balkan States	42	B3
Alberta, Canada	I		Edmonton	Canada	6	E5
Aleutian Islands (U.S.)	I		Unalaska	Alaska	3	E4
Algeria (Fr.)	I		Algiers (Alger)	Africa	61	B2
Andaman Is. (India)	I	(Andamans)	Port Blair	India Pakistan & Ceylon	53	F6
Andorra	I		Andorra la Vella	Spain & Portugal	33	G1
Angola	IX	(Portuguese West Africa)	Luanda	Africa	61	D6
Antarctica	I		.....	The World	2	—
Antigua	I		St. John's	The West Indies	8	G3
Antilles, Greater, Lesser	I	(Antilles)	.....	The West Indies	8	E3
Arabia	I		.....	The Near East	54	D5
Arctic Ocean	I		.....	The World	2	—
Argentina	I		Buenos Aires	South America	22	G11
Arizona, U.S.	I		Phoenix	United States	13	E6
Arkansas, U.S.	I		Little Rock	United States	11	K6
Armenian S.S.R. (U.S.S.R.)	I	(Armenia)	Erivan (Yerevan)	U.S.S.R.	45	F6
Ascension Island (Br.)	I	(Ascension)	Georgetown	Africa	61	A5
Asia	I		.....	Asia	49	—
Australia, Commonwealth of	II		Canberra	Australia & New Zealand	63	—
Australian Capital Territory	II	(Australia, Commonwealth of)	Canberra	Australia & New Zealand	63	E4
Austria	II		Vienna (Wien)	Austria, Czech. & Hungary	41	C3
Azerbaidzhan S.S.R. (U.S.S.R.)	II	(Azerbaijan)	Baku	U.S.S.R.	45	G6
Azores Islands (Port.)	II		Ponta Delgada	The World	1	H4
Bahama Islands (Br.)	II	(Bahamas)	Nassau	The West Indies	8	C1
Bahrein Islands	II		Manama	The Near East	55	F4
Balearic Islands (Sp.)	II		Palma	Spain & Portugal	33	H3
Barbados (Br.)	II		Bridgetown	The West Indies	8	G4
Basutoland (Br.)	II		Maseru	Africa	61	E8
Bechuanaland Protectorate (Br.)	II	(Bechuana)	Mafeking	Africa	61	E7
Belgian Congo	II		Léopoldville	Africa	61	E5
Belgium	II		Brussels (Bruxelles)	Netherlands, Belgium & Lux.	35	E7
Bermuda (Br.)	II		Hamilton	The West Indies	8	G2
Bhutan	II		Bumthang	India, Pakistan & Ceylon	52	F3
Bismarck Archipelago (Terr. of New Guinea)	II		Rabaul	Pacific Ocean	64	E6
Bolivia	II		La Paz, Sucre	South America	20	G7
Bonin Is. (U.S. Adm.)	II		.....	Pacific Ocean	64	E3
Borneo	II		.....	Southeast Asia	58	E5
Brazil	II		Brasília, Rio de Janeiro	South America	20, 21	J6
British Columbia, Canada	II		Victoria	Canada	6	D5
British Honduras	II		Belize	Central America	16	C2
Brunei (Br.)	II	(British Commonwealth of Nations)	Brunei	Southeast Asia	58	E4
Bulgaria	II		Sofia (Sofiya)	Balkan States	42	D3

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Country (In Map)	Article in Volume	Discussed in Article	Capital or Chief Town	Map Title	Map Plate	Location Reference
Burma	II		Rangoon	Burma, Thailand, Indochina	57	B2
Byelorussian S.S.R. (White Russian S.S.R.) (U.S.S.R.)	II		Minsk	U.S.S.R.	45	C4
California, U.S.	II		Sacramento	United States	12, 13	C5
Cambodia	II		Phnom Penh (Pnompenh)	Burma, Thailand, Indochina	57	E4
Cameroons (Br. Trust.)	II		Lagos	Africa	61	C4
Cameroun	II	(Cameroons)	Yaoundé	Africa	61	D4
Canada	II		Ottawa	Canada	6, 7	—
Canal Zone (U.S.)	II		Balboa Heights	Central America	17	G6
Canary Islands (Sp.)	II		Las Palmas, Santa Cruz	Spain & Portugal	32	B4
Cape Verde Islands (Port.)	II		Praia	The World	1	H5
Caroline Islands (U.S. Trust.)	III		Moen, Ponape (Yap)	Pacific Ocean	64	F5
Celebes, Indonesia	III		Makassar	Southeast Asia	59	G6
Central Africa	II	(British Central Africa)	Bangui	Africa	61	D4
Central America	III		.....	Central America	16, 17	—
Ceylon	III		Colombo	India, Pakistan & Ceylon	53	D7
Chad	V	(French Equatorial Africa)	Fort Lamy	Africa	61	D3
Channel Islands (Br.)	III		St. Helier	Great Britain & Ireland	27	E6
Chatham Islands (N.Z.)	III		Waitangi	Pacific Ocean	64	J10
Chile	III		Santiago	South America	22	F11
China: Mainland	III	(China)	Peiping (Peking)	China, Japan, Korea	50, 51	F5
China: Taiwan	III	(Formosa)	Taipei	China, Japan, Korea	51	K7
Christmas Island (Aust.)	III		.....	Asia	49	H6
Colombia	III		Bogotá	South America	20	F3
Colorado, U.S.	III		Denver	United States	13	G5
Comoro Is. (Is. Comores) (Fr.)	III		Dzaoudzi	Africa	61	G6
Congo (Belgian Congo)	II		Léopoldville	Africa	61	D5
Connecticut, U.S.	III		Hartford	United States	10	P2
Cook Islands (N.Z.)	III		Avarua	Pacific Ocean	64	L7
Corsica (Corse) (Fr.)	III		Ajaccio	Italy	38	B3
Costa Rica	III		San José	Central America	16, 17	E5
Crete (Krētē), Greece	III		Candia (Canea) (Erákleion)	Balkan States	42	D5
Cuba	III		Havana	The West Indies	8	B2
Curaçao (Neth. Antilles)	III		Willemstad	The West Indies	8	E4
Cyprus	III		Nicosia	The Near East	54	B2
Czechoslovakia	III		Prague (Praha)	Austria, Czech. & Hungary	41	D2
Dahomey	III		Porto-Novo	Africa	61	C4
Damão (Port. India)	IX	(Portugal)	Damão	India, Pakistan & Ceylon	53	B4
Delaware, U.S.	IV		Dover	United States	11	P5
Denmark	IV		Copenhagen (Köbenhavn)	Norway, Sweden, Finland & Denmark	37	E9

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Country (In Map)	Article in Volume	Discussed in Article	Capital or Chief Town	Map Title	Map Plate	Location Reference
District of Columbia, U.S.	IV		Washington	United States	11	O5
Diu (Port. India)	IV	(Portugal)	Diu	India, Pakistan & Ceylon	53	B4
Dominica (Br.)	IV		Roseau	The West Indies	8	G4
Dominican Republic	IV		Ciudad Trujillo	The West Indies	8	D3
Ecuador	IV		Quito	South America	19	C3
Egypt, U.A.R.	IV		Cairo	Africa	61	E2
England	IV		London	Great Britain & Ireland	27	E4
Eritrea	IV		Asmara	Africa	61	F3
Estonia (Estonian S.S.R., U.S.S.R.)	IV		Tallinn (Tallin)	U.S.S.R.	44	C3
Ethiopia	IV		Addis Ababa	Africa	61	F4
Europe	IV		.....	Europe	25	—
Faeröe Islands (Den.)	IV	(Faroe Islands)	Thorshavn	Europe	25	D2
Falkland Islands (Br.)	IV		Stanley	South America	22, 23	H14
Fed. of Rhodesia & Nyasaland	IV	(Rhodesia & Nyasaland, Federation of)	Salisbury	Africa	61	E6
Fernando Pó island, Sp. Guinea	IV		Santa Isabel	Africa	61	C4
Fiji (Br.)	IV	(Fiji Islands)	Suva	Pacific Ocean	64	H7
Finland	IV		Helsinki	Norway, Sweden, Finland & Denmark	36	O5
Florida, U.S.	IV		Tallahassee	United States	11	M7
Formosa (Taiwan) (China)	IV		Taipei (Taipeh)	China, Japan, Korea	51	K7
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Melbourne,* Vic.	D4	63
Memel (Klaipéda), U.S.S.R.	B3	44
Memphis, Tenn.	L6	11
Mendoza, Arg.	G10	22
Mérida, Mex.	P6	15
Merthyr Tydfil, Wales	E5	27
Meshed, Iran	H2	55
Messina, Sicily, It.	E5	39
Metz, Fr.	G3	28
Mexico City,* Mex.	L1	15
Miami, Fla.	N8	11
Middlesbrough, Eng.	F3	27
Milan (Milano), It.	B2	38
Milwaukee, Wis.	M4	10
Minhow (Foochow), China	J6	51
Minneapolis, Minn.	K3	10
Minsk, U.S.S.R.	C4	45
Miskolc, Hung.	F2	41
Mobile, Ala.	M7	11
Modena, It.	C2	38
Mogadiscio (Mogadishu),* Somalia	G4	61

Moji, Jap. M5 51
Molenbeek-Saint Jean, Belg. B9 35
Molotov (Perm), U.S.S.R. F4 46
Monterrey (Monterey), Mex. J4 14
Montevideo,* Uru. K11 23
Montgomery,* Ala. M6 11
Montpelier,* Vt. P3 10
Montpellier, Fr. E6 29
Montreal, Que. K7 7
Montreuil-sous-Bois, Fr. B2 28
Monza, It. B2 38
Morioka, Jap. O4 51
Moscow (Moskva),* U.S.S.R. E3 44
Mosul, Iraq D2 54
Motherwell, Scot. B1 26
Mt. Vernon, N.Y. S5 10
Mukden (Shenyang), China K3 51
Mülheim, Ger. G4 31
Mulhouse, Fr. G4 28
Multan, Pak. B2 52
Munich (München), Ger. D4 30
Münster, Ger. B3 30
Murcia, Sp. F4 33
Murmansk, U.S.S.R. D1 44
Mysore, India C6 53
Nagano, Jap. N4 51
Nagaoka, Jap. N4 51
Nagasaki, Jap. L5 51
Nagoya, Jap. N4 51
Nagpur, India C4 53
Nairobi,* Kenya F5 61
Nanchang, China H6 51
Nancy, Fr. G3 28
Nanking, China J5 51
Nanning, China G7 50
Nantes, Fr. C4 28
Naples (Napoli), It. E4 39
Nashville,* Tenn. M5 11
Nassau,* Bahama Is. C1 8
Neuilly-sur-Seine, Fr. A1 28
Neuss, Ger. F5 31
Newark, N.J. R5 11
New Bedford, Mass. R2 10
New Britain, Conn. P2 10
Newcastle, N.S.W. E4 63
Newcastle-on-Tyne, Eng. F3 26
New Delhi,* India C3 52
New Haven, Conn. O2 10
New Orleans, La. L7 11
Newport, Eng. E5 27
New York, N.Y. R5 11
Niagara Falls, N.Y. O4 10
Nice, Fr. G6 29
Nictheroy (Niterói), Brazil P14 23
Niigata, Jap. N4 51
Nijmegen, Neth. H5 34
Nikolaev (Nikolayev), U.S.S.R. D5 45
Nimes (Nismes), Fr. F6 29
Ningpo (Ninghsien), China K6 51
Niterói, Braz. P14 23
Nizhni Novgorod (Gor'kiy), U.S.S.R. F3 44
Norfolk, Va. P5 11
Norrköping, Swed. K7 37
Northampton, Eng. F4 27
Nottingham, Eng. F4 27
Nouméa,* N. Cal. G8 64
Novara, It. B2 38
Novi Sad, Yugo. C2 42
Novocherkassk, U.S.S.R. F5 45
Novorossiysk (Novorossiisk), U.S.S.R. E6 45
Novosibirsk, U.S.S.R. J4 46
Nürnberg (Nuremberg), Ger. D4 30
Oak Ridge, Tenn. M5 11
Oakland, Calif. D8 13
Oberammergau, Ger. D5 30
Oberhausen, Ger. G4 31
Odense, Den. G9 37
Odessa, U.S.S.R. B5 45
Offenbach, Ger. C3 30
Okayama, Jap. M4 51
Oklahoma City,* Okla. J6 13
Oldenburg, Ger. B2 30
Oldham, Eng. E4 27
Olomouc (Olmütz), Czech. D2 41
Olympia,* Wash. C3 12
Omaha, Neb. J4 12
Omdurman, Sudan E3 61
Omsk, U.S.S.R. H4 46
Omuda, Jap. M5 51
Oporto (Porto), Port. D2 32
Oradea, Rum. C2 42
Oran, Alg. B1 61
Ordzhonikidze, U.S.S.R. F6 45
Orel, U.S.S.R. E4 45
Orenburg (Chkalov), U.S.S.R. F4 46
Orléans, Fr. D3 28
Osaka, Jap. M4 51
Oslo,* Nor. D3 36
Osnabrück, Ger. C2 30
Ostrava, Czech. D2 41
Otaru, Jap. O3 51
Ottawa,* Canada J6 7
Oxford, Eng. F5 27
Padova (Padua), It. C2 38
Pago Pago,* Amer. Samoa K7 64
Paisley, Scot. D3 26
Palembang, Sumatra, Indon. D6 58
Palermo, Sicily, It. D5 39
Palmas, Las,* Can. Is., Sp. B4 32
Panamá,* Pan. H6 17
Paoting (Tsingyuen), China H4 51
Papeete,* Tahiti, Soc. Is. M7 64
Pará (Belém), Braz. L4 21
Parahyba (João Pessoa), Braz. O5 21
Paramaribo,* Sur. K2 21
Paraná, Arg. J10 23
Paris,* France E3 28
Greater B2 28
Parma, It. C2 38
Pasadena, Calif. D8 13
Passaic, N.J. R5 10
Paterson, N.J. R5 10
Patna, India E3 52
Pátrai (Patras), Gr. C4 42
Pécs, Hung. E3 41
Peiraiévs (Piraeus), Gr. C4 42
Peking (Peiping),* China J3 51
Pelotas, Braz. K10 23
Penang (George Town), Mal. Fed. C6 57
Penza, U.S.S.R. F4 45
Peoria, Ill. L4 10
Perm, U.S.S.R. F4 46
Pernambuco (Recife), Braz. O5 21
Perpignan, Fr. E6 29
Perth,* W. Aust. A4 63
Perugia, It. D3 38
Peshawar, Pak. B2 52
Pforzheim, Ger. C4 30
Philadelphia, Pa. R6 11
Phnom Penh,* Cambodia E5 57
Phoenix,* Ariz. E6 13
Piacenza, It. B2 38
Pierre,* S.D. H3 12
Pilsen (Plzen), Czech. B2 41
Pinkiang (Harbin), China L2 51
Piraeus (Peiraiévs), Gr. C4 42
Pisa, It. C3 38
Pistoia, It. C3 38
Pittsburgh, Pa. O4 10
Plauen, Ger. D3 30
Ploeşti, Rum. D2 42
Plovdiv, Bul. D3 42
Plymouth, Eng. E5 27
Plzen (Pilsen), Czech. B2 41
Pola (Pula), Yugo. A3 42
Poltava, U.S.S.R. E5 45
Pontiac, Mich. M1 10
Poole, Eng. E5 27
Poona, India B5 53
Port Arthur (Lushun), China K4 51
Port-au-Prince,* Haiti D3 8
Portland, Me. R4 10
Portland, Ore. C3 12
Port Elizabeth, C. of G. H. E8 61
Port Moresby,* Pap. Terr., Aust. B7 58
Porto (Oporto), Port. B2 32
Pôrto Alegre, Braz. L10 23
Port of Spain,* Trinidad G5 8
Port Said, Egypt F1 61
Portsmouth, Eng. F5 27
Poznan (Posen), Pol. C2 43
Praha (Prag, Prague),* Czech. C1 41
Preston, Eng. E4 27
Pretoria,* U. of So. Africa E7 61

Providence,* R.I.	P2	10
Pskov, U.S.S.R.	C3	44
Puebla, Mex.	N2	15
Pula (Pola), Yugo.	A3	42
Pusan (Fusan), Korea	L4	51
P'yŏngyang,* N. Korea	K4	51
Quebec,* Que.	J6	7
Quetta, Pak.	A2	52
Quezon City,* P.I.	G3	59
Quincy, Mass.	R2	10
Quito,* Ecu.	E3	20
Rabat,* Mor.	B1	61
Racine, Wis.	L4	10
Radom, Poland	E3	43
Raleigh,* N.C.	O6	11
Rangoon,* Burma	C3	57
Ravenna, It.	D2	38
Rawalpindi,* Pak.	B2	52
Reading, Eng.	F5	27
Reading, Pa.	P4	10
Recife (Pernambuco), Braz.	O5	21
Recklinghausen, Ger.	B3	30
Regensburg (Ratisbon), Ger.	D4	30
Reggio di Calabria, It.	E5	39
Reggio nell'Emilia, It.	C2	38
Reims, Fr.	E3	28
Remscheid, Ger.	G5	31
Rennes, Fr.	C3	28
Resht, Iran	E2	54
Reykjavík,* Ice.	C2	25
Rheydt, Ger.	B3	30
Rhondda, Wales	E5	27
Ribeirão Prêto, Braz.	L8	21
Richland, Wash.	D3	12
Richmond,* Va.	O5	11
Riga, U.S.S.R.	B3	44
Rijeka (Fiume), Yugo.	A2	42
Rimini, It.	D2	38
Rio de Janeiro,* Braz.	P14	23
Riyadh,* Saudi Arabia	E5	54
Roanoke, Va.	N5	11
Rochester, N.Y.	O4	10
Rockford, Ill.	L4	10
Rome (Roma),* It.	D4	38
Rosario, Arg.	H10	22
Rostock, Ger.	D1	30
Rostov (Rostov-on-Don), U.S.S.R.	F5	45
Rotherham, Eng.	F4	27
Rotterdam, Neth.	E5	34
Roubaix, Fr.	E2	28
Rouen, Fr.	D3	28
Ryazan', U.S.S.R.	E4	45
Rybinsk, U.S.S.R.	E3	44
Saarbrücken, Ger.	B4	30
Sacramento,* Cal.	C5	12
Saginaw, Mich.	N4	10
Saharanpur, India	C3	52
Saïgon,* S. Viet Nam	E5	57
St. Denis, Fr.	B1	28
St. Étienne, Fr.	F5	29
St. Gallen (Sankt Gallen), Switz.	E1	40
St. Helens, Eng.	E4	27
Saint John, New Brunswick	K7	7
St. John's,* Nfld.	L6	7
St. Joseph, Mo.	K5	11
St. Louis, Mo.	L5	11
St. Paul,* Minn.	K3	10
Sakai, Jap.	N5	51
Salem,* Oreg.	C3	12
Salerno, It.	E4	39
Salisbury,* Fed. of Rhod. and Nyas.	F6	61
Salonika (Thessalonikē), Gr.	C3	42
Salt Lake City,* Utah	F4	12
Salvador (Bahia), Brazil	N6	21
Samarkand, U.S.S.R.	G5	46
San Antonio, Texas	J7	13
San Diego, Calif.	D6	13
Sandakan, N. Bor.	F4	59
San Francisco, Calif.	D8	13
San Jose, Calif.	D8	13
San José,* C.R.	F5	17
San Juan,* P.R.	G1	8
San Luis Potosí, Mex.	J6	15
San Salvador,* El Sal.	C4	16
Santa Ana, El Sal.	C4	16
Santa Cruz de Tenerife,* (Santa Cruz), Can. Is., Sp.	B4	32
Santa Fé, Arg.	H10	22
Santa Fe,* N.M.	G6	13
Santander, Sp.	D1	32
Santiago,* Chile	O10	23
Santiago de Cuba, Cuba	C3	8
Santos, Braz.	L8	23
São Luís (Maranhão), Braz.	M4	21
São Paulo, Braz.	L8	23
Sapporo, Jap.	O3	51
Saragossa (Zaragoza), Sp.	F2	33
Sarajevo, Yugo.	B3	42
Saratov, U.S.S.R.	G4	45
Sasebo, Jap.	L5	51
Sassari, Sardinia, It.	B4	39
Savannah, Ga.	N6	11
Savona, It.	B2	38
Schaerbeek, Belg.	C9	35
Schenectady, N. Y.	P4	10
Schwerin, Ger.	D2	30
Scranton, Pa.	P4	10
Scutari (Üsküdar), Turk.	A1	54
Seattle, Wash.	C3	12
Semarang, Java., Indon.	J2	59
Sendai, Jap.	O4	51
Seoul,* S. Korea	L4	51
Serpukhov, U.S.S.R	E4	45
Sevastopol', U.S.S.R.	D6	45
Sevilla (Seville), Sp.	D4	32
Seyhan (Adana), Turk.	C2	54
's Gravenhage (The Hague)* Neth.	E4	34
Shahjahanpur, India	D3	52
Shanghai, China	K5	51
Shasi, China	H5	50
Shcherbakov (Rybinsk), U.S.S.R.	E3	44
Sheffield, Eng.	F4	27
Shenyang (Mukden), China	K3	51
Sherbrooke, Que.	J6	7
Shimonoseki, Jap.	M5	51
Shizuoka, Jap.	N5	51
Shufu (Kashgar), China	C7	50
Shreveport, La.	K6	11
Siangtan, China	H6	50
Simferopol', U.S.S.R.	D6	45
Singapore,* Sing.	C5	58
Sioux City, Iowa	L4	10
Skopje (Skoplje, Üsküb), Yugo.	C3	42
Smolensk, U.S.S.R.	D4	45
Smyrna (Izmir), Turk.	A2	54
Sofia (Sofiya),* Bul.	C3	42
Solingen, Ger.	G5	31
Somerville, Mass.	R2	10
Soochow, China	K5	51
Sosnowiec, Poland	B4	43
Southampton, Eng.	F5	27
South Bend, Ind.	M4	10
Southend-on-Sea, Eng.	G5	27
Southport, Eng.	E4	27
South Shields, Eng.	F3	26
Sovetsk (Tilsit), U.S.S.R	B4	44
Spezia, La, It.	B2	38
Spokane, Wash.	D3	12
Springfield,* Ill.	L5	11
Springfield, Mass.	O1	10
Springfield, Ohio	N4	10
Srinagar,* Kash.	C2	52
Stalingrad, U.S.S.R.	F5	45
Stalino, U.S.S.R.	E5	45
Stanislav (Stanisławów), U.S.S.R.	B5	45
Stettin (Szczecin), Pol.	B2	43
Stockholm,* Swed.	G1	36
Stockport, Eng.	F4	27
Stockton-on-Tees, Eng.	F3	27
Stoke-on-Trent (Stoke-upon-Trent), Eng.	E4	27
Strasbourg, Fr.	G3	28
Stuttgart, Ger.	C4	30
Subotica, Yugo.	B2	42
Sucre,* Bolivia	H7	20
Suez, Egypt	F2	61
Sunderland, Eng.	F3	26
Surabaja (Surabaya), Java, Indon.	K2	59
Surakarta, Java, Indon.	J2	59
Suva,* Fiji Is.	H7	64
Sverdlovsk, U.S.S.R.	G4	46
Swansea, Wales	D5	27

Swatow, China J7 51
Swindon, Eng. E5 27
Sydney,* N.S.W. E4 63
Syracuse, N.Y. O4 10
Syzran', U.S.S.R. G4 45
Szczecin (Stettin), Pol. B2 43
Szeged, Hung. E3 41
Tabriz, Iran E2 54
Tacoma, Wash. C3 12
Taegu, Korea L4 51
Taganrog, U.S.S.R. E5 45
Tainan, Taiwan, China J7 51
Taipei,* Taiwan, China K7 51
Taiyüan, China H4 50
Takamatsu, Jap. M5 51
Takaoka, Jap. N4 51
Tallahassee,* Fla. M7 11
Tallinn (Tallin), U.S.S.R. B3 44
Tambov, U.S.S.R. F4 45
Tampa, Fla. N8 11
Tampere, Fin. N6 37
Tampico, Mex. L5 15
Tananarive* (Tananarivo), Mada. G6 61
Tangier, Mor. B1 61
Tanjore, India C6 53
Taranto, It. F4 39
Tartu, U.S.S.R. C3 44
Tashkent, U.S.S.R. G5 46
Tbilisi (Tiflis), U.S.S.R. F6 45
Tegucigalpa,* Hon. D3 16
Tehran (Teheran),* Iran F2 55
Tel Aviv-Jaffa, Israel B3 56
Terni, It. D3 38
Thessalonikē (Salonika, Thessaloniki), Gr. C3 42
Tientsin, China J4 51
Tiflis (Tbilisi), U.S.S.R. F6 45
Tilburg, Neth. G5 35
Tilsit (Sovetsk), U.S.S.R. B4 44
Timişoara (Temesvár), Rum. C2 42
Tiranë (Tirana),* Alb. B3 42
Tokushima, Jap. M5 51
Tokyo,* Jap. O4 51
Toledo, Ohio N4 10
Tomsk, U.S.S.R J4 46
Topeka,* Kans. K5 11
Torino (Turin), It. A2 38
Toronto,* Ont. E6 6
Torreón, Mex. H4 14
Toruń (Thorn), Poland D2 43
Toulon, Fr. F6 29
Toulouse, Fr. D6 29
Tourcoing, Fr. E2 28
Tours, Fr. D4 28
Toyama, Jap. N4 51
Toyohashi, Jap. N5 51
Trapani, Sicily, It. D5 39
Trento, It. C1 38
Trenton,* N.J. R5 11
Treviso, It. D2 38
Trier (Treves), Ger. B4 30
Trieste, Italy D2 38
Tripoli,* Libya D1 61
Trois Rivières, Que. J6 7
Trondheim, Nor. F5 36
Troy, N.Y. O1 10
Troyes, Fr. F3 28
Tsinan, China J4 51
Tsingtao, China K4 51
Tsingyuen (Paoting), China H4 51
Tsitsihar (Lungkiang), China L2 51
Tsu, Jap. N5 51
Tucumán, Arg. H9 22
Tula, U.S.S.R. E4 45
Tulsa, Okla. K5 11
Tunis,* Tun. D1 61
Turin (Torino), It. A2 38
Tuticorin, India C7 53
Tynemouth, Eng. F3 26
Udine, It. D1 38
Ufa, U.S.S.R. J4 45
Ujpest, Hung. E3 41
Ulan Bator (Urga),* Mongolia G2 50
Ulm, Ger. C4 30
Ul'yanovsk, U.S.S.R. G4 45
Üsküb (Skoplje, Skopje), Yugo. C3 42
Üsküdar (Scutari), Turk. A1 54
Utica, N.Y. P4 10
Utrecht, Neth. G4 34
Utsunomiya, Jap. O4 51
Valencia, Sp. F3 33
Valletta,* Malta E7 39
Valparaíso, Chile N10 23
Vancouver, B.C. D6 6
Varanasi (Banaras), India D3 52
Varna, Bul. E3 42
Venice (Venezia), It. D2 38
Veracruz, Mex. Q2 15
Verona, It. C2 38
Versailles, Fr. A2 28
Vicenza, It. C2 38
Vichy, Fr. E4 29
Victoria,* Hong Kong J7 51
Victoria,* Br. Col. D6 6
Vienna (Wien),* Austria D2 41
Vientiane,* Laos D3 57
Vigo, Sp. B1 32
Villeurbanne, Fr. F5 29
Vilna (Vil'nyus), U.S.S.R. C4 45
Vinnitsa, U.S.S.R. C5 45
Vitebsk, U.S.S.R. C3 45
Vladivostok, U.S.S.R. O5 47
Vologda, U.S.S.R. F3 44
Voronezh, U.S.S.R. F4 45
Voroshilovgrad (Lugansk), U.S.S.R. F5 45
Vyborg (Viipuri), U.S.S.R. C2 44
Wakayama, Jap. N5 51
Wallasey, Eng. F2 26
Walsall, Eng. F4 27
Wanne-Eickel, Ger. G4 31
Warrington, Eng. G2 26
Warsaw (Warszawa),* Poland E2 43
Washington, D.C.,* U.S. O5 11
Waterbury, Conn. O2 10
Wattenscheid, Ger. G4 31
Wellington,* N.Z. F4 63
Wenchow (Yungkia), China K6 51
West Hartlepool, Eng. F3 27
Wichita, Kans. J5 13
Wien (Vienna),* Austria D2 41
Wiesbaden, Ger. B3 30
Wigan, Eng. E4 27
Wilkes-Barre, Pa. P4 10
Willemstad,* Neth. Ant. E4 8
Wilmington, Del. P5 10
Wimbledon, Eng. B5 27
Windsor, Ont. D8 6
Winnipeg,* Man. G6 6
Winston-Salem, N. C. N5 11
Winterthur, Switz. D1 40
Witten, Ger. G4 31
Włocławek, Pol. D2 43
Wolverhampton, Eng. E5 27
Worcester, Eng. E5 27
Worcester, Mass. P1 10
Worms, Ger. C4 30
Wrocław (Breslau), Pol. C3 43
Wuchow (Tsangwu), China H7 50
Wuhan, China H5 51
Wuhu, China J5 51
Wuppertal, Ger. G4 31
Würzburg, Ger. D4 30
Yarkand (Soche), China C7 50
Yarmouth (Great Yarmouth), Eng. G4 27
Yaroslavl', U.S.S.R. E3 44
Yawata, Jap. L5 51
Yerevan (Erivan), U.S.S.R. F6 45
Yokohama, Jap. O4 51
Yokosuka, Jap. O5 51
Yonkers, N.Y. R5 10
York, Eng. F4 27
York, Pa. O5 10
Youngstown, Ohio N4 10
Yungki (Kirin), China L3 51
Zabrze (Hindenburg), Pol. A4 43
Zagreb, Yugo. A2 42
Zaragoza (Saragossa), Sp. F2 33
Zhdanov (Mariupol'), U.S.S.R E5 45
Zhitomir, U.S.S.R. C4 45
Zlatoust, U.S.S.R. F4 46
Zürich, Switz. D1 40
Zwickau, Ger. E3 30

Population of the World

An Alphabetical Listing Giving Population Data for Important Cities, Towns, and Islands and Including Geographical Points

This list includes almost all of the world's important locations and gives population figures for the principal cities, towns, and islands. Communities important as commercial centers, railroad communication points, post offices, resorts, or military installations, but without permanent inhabitants, are not included. The population statistics given here represent the most recent available information. Statistics for U.S. locations are those of the 1960 Decennial Census of Population; population figures for other locations are based on the latest official censuses or estimates.

Cities that are capitals of countries, states, or provinces are designated by an asterisk (*). Population figures that include suburbs are designated by a dagger (†).

POPULATION OF THE WORLD

* designates capitals

† designates inclusion of suburbs

A

Aabenraa, Denmark, 14,219
Aachen (Aix la Chapelle), Germany, 169,769
Aalborg, Denmark, 85,800
Aalen, Germany, 31,814
Aalst (Alost), Belgium, 45,257
Aarau, Switzerland, 17,045
Aarhus, Denmark, 119,568
Aarlen (Arlon), Belgium, 13,421
Aba, Nigeria, 57,787
Abadan, Iran, 226,083
Abadeh, Iran, 8,192
Abakan, U.S.S.R., 56,000
Abancay, Peru, 9,083
Abashiri, Japan, 44,052
Abau, Papua
Abaya (lake), Ethiopia
Abbazia (Opatija), Yugo., 6,830
Abbeville, France, 18,932
Abbottabad, Pakistan, 27,602
Abdulino, U.S.S.R., 13,636
Abécher, Chad, 9,877
Abeokuta, Nigeria, 56,600
Abercorn, N. Rhodesia, 1,177
Aberdare, Wales, 39,044
Aberdeen (lake), N.W. Terrs.
Aberdeen, Scotland, 185,379
Abertillery, England, 25,160
Abha, Saudi Arabia, 15,000
Abidjan,* Ivory Coast, †180,000
Abilene, Tex., 90,368
Abitibi (lake), Canada
Abitibi (river), Ontario
Åbo (Turku), Finland, 124,243
Abomey, Dahomey, 16,906
Abony, Hungary, 16,273
Abu 'Arish, Saudi Arabia, 5,000
Abu Dhabi, Tr. Oman, 4,000
Abu Road, India, 9,935
Abunã, Brazil
Acadia Valley, Alta., 99
Acambaro, Mex., 26,011
Acapulco, Mexico, 48,846
Accra,* Ghana, †491,060
Accrington, England, 40,987
Achill (island), Ireland
Achill Head (cape), Ireland
Achinsk, U.S.S.R.
Acireale, Italy, 34,330
Acklins (island), Bahama Is., 1,273
Aconcagua (mountain), Arg.
Acqui, Italy, 12,328
Acre (Ako), Israel, 25,128
Acre (river), Brazil
Adalia (gulf), Turkey
Adana (Seyhan), Turkey, 230,024
Adapazari, Turkey, 80,160
Adaut, Indonesia
Addanki, India, 11,310
Addis Ababa,* Ethiopia, 400,000
Addis Alam, Ethiopia, 1,000
Adelaide, Australia, †587,957
Adelboden, Switzerland, 2,881
Aden, S. Arabia (*Aden Prot.) †97,760
Adilabad, India, 11,128
Adirondack (mountains), U.S.
Adiyaman, Turkey, 17,021
Admiralty (gulf), Australia
Admiralty (islands), Territory N.G., 14,420
Adoni, India, 53,583
Adrano, Italy, 26,952
Adrar, Algeria, 2,107
Adrar (reg.), Mauritania, 49,000
Adria, Italy, 22,990
Adrianople (Edirne), Turkey, 31,865
Adriatic (sea)
Aduwa, Ethiopia, 6,000
Aegean (sea)
Afmadu, Somali Rep., †2,051
'Afula, Israel, 13,816
Afyon, Turkey, 38,392
Agadès, Niger, 4,531
Agadir, Morocco, 16,722
Agaña,* Guam, 1,330
Agartala, India, 42,595
Agen, France, 28,591
Aginskoye, U.S.S.R.
Agira, Italy, 15,677
Agordat, Ethiopia, 2,000
Agra, India, 509,108
Ağri (Karaköse), Turkey, 19,786
Agrigento, Italy, 37,506
Agrínion, Greece, 24,763
Agua Prieta, Mexico, 15,275
Aguadas, Colombia, 8,064
Aguadilla, P.R., 15,943
Aguascalientes, Mexico, 126,222
Aguilar, Spain, 15,275
Aguilas, Spain, 11,829
Aguja (point), Peru
Agulhas (cape), S. Africa
Ahaggar (mts.), Algeria
Ahar, Iran, 20,047
Ahlen, Germany, 40,485
Ahmadabad, India, 1,149,852
Ahmadnagar, India, 118,266
Ahmadpur East, Pakistan, 20,404
Ahuachapán, El Salvador, 13,298
Ahvenanmaa (Aland) (isls.), Finland, 20,921
Ahwar, S. Arabia, 5,000
Ahwaz, Iran, 120,098
Aígion, Greece, 17,762
Aïn-Sefra, Algeria, 3,500
Aioun el Atrous, Mauritania, 900
Aïr (Asben) (mountains), Niger
Airdrie, Scotland, 33,620
Aire (river), England
Aitape, Terr. N.G., 161
Aitutaki (island), Cook Is., 2,356
Aiud, Rumania, 11,886
Aix, France, 32,076
Aix-les-Bains, France, 10,720
Aizuwakamatsu, Japan, 97,885
Ajaccio, France, 28,732
Ajedabia, Libya, 7,000
'Ajlun, Jordan, 5,384
Ajmer, India, 230,999
Akashi, Japan, 129,780
Aken, Germany, 14,624
Aketi, R.o.t. Congo, 14,691
Akhdar (mts.), Oman
Akhisar, Turkey, 40,013
Akhmim, Egypt, 32,071
Akhty, U.S.S.R., 3,886
Akimiski (island), N.W. Terrs.
Akita, Japan, 203,661
Akjoujt, Mauritania, 2,000
Aklavik, N.W. Terrs., 1,445
Akmolinsk (Tselinograd), U.S.S.R. 101,000
Akola, India, 115,820
Akpatok (island), N.W. Terrs.
Akron, Ohio, 290,351
Aksaray, Turkey, 20,046
Akşehir, Turkey, 20,607
Aksum, Ethiopia, 10,000
Aktyubinsk, U.S.S.R., 97,000
Akureyri, Iceland, 8,835
Akyab, Burma, 41,589
Al Ittihad,* South Arabia
Al Kadhimain, Iraq, 115,760
Al Kuwait,* Kuwait, †119,472
Alabama (river), U.S.
Alagir, U.S.S.R., 4,192
Alagoinhas, Brazil, 38,246
Alajuela, Costa Rica, 19,564
Alameda, Calif., 63,855
Aland (isls.), Finland, 20,921
Alanya, Turkey, 10,133
Alapayevsk, U.S.S.R., 30,000
Alaşehir, Turkey, 13,923
Alaska (mtn. range), Alaska
Alaska (peninsula), Alaska
Alatyr', U.S.S.R., 25,567
Alausí, Ecuador, 4,812
Alba, Italy, 13,807
Alba Iulia, Rumania, 14,776
Albacete, Spain, †74,417
Albany, Australia, 10,526
Albany,* N.Y., 129,726
Albany (river), Ontario
Alberga (river), Australia
Alberni, B.C., 4,616
Albert, France, 8,742
Albert (lake), Africa
Alberton, P.E.I., 855
Albertville, R.o.t. Congo, 29,488
Albi, France, 27,768
Albina, Surinam, 370
Albuquerque, N. Mex., 201,189
Albury, Australia, 18,621
Alcalá de Guadaira, Spain, 17,844
Alcalá de Henares, Spain, 14,651
Alcamo, Italy, 41,471
Alcázar de San Juan, Spain, 22,964

* designates capitals

† designates inclusion of suburbs

Alchevsk (Kommunarsk), U.S.S.R. 98,000
Alcira, Spain, 21,059
Alcobaça, Brazil, 1,812
Alcoy, Spain, 39,417
Aldabra (islands), Seychelles, 100
Aldan (river), U.S.S.R.
Aldershot, England, 31,260
Aleg, Mauritania, 352
Alegrete, Brazil, 33,735
'Aleih, Lebanon, 5,271
Aleksandrovsk-Sakhalinskiy, U.S.S.R., 40,000
Aleksandrovskiy Zavod, U.S.S.R., 2,097
Aleksinac, Yugoslavia, 6,735
Alençon, France, 19,427
Aleppo, Syria, 425,029
Alès, France, 20,259
Alessandria, Italy, 70,238
Ålesund, Norway, 19,170
Aleutian (islands), Alaska
Alexandra, New Zealand, 2,296
Alexandretta (Iskenderun), Turkey, 63,736
Alexandria, Egypt, 1,497,026
Alexandria, Rumania, 19,294
Alexandria, Va., 91,023
Alexandroúpolis, Greece, 18,712
Alfeld, Germany, 13,086
Alfreton, England, 22,998
Algeciras, Spain, 20,610
Algemesí, Spain, 15,510
Algés, Portugal, 9,826
Alghero, Italy, 18,602
Algiers (Alger),* Algeria, 329,700
Alicante, Spain, †121,527
Alice Arm, Br. Columbia, 75
Alice Springs, Aust., 4,648
Aligarh, India, 183,753
Alipore, India, 46,332
Aliwal North, C. of G.H., 10,706
Alkmaar, Netherlands, 43,606
Allahabad, India, 431,007
Allen (lake), Ireland
Allen, Bog of, Ireland
Allenstein (Olsztyn), Poland, 64,300
Allentown, Pa., 108,347
Alleppey, India, 116,278
Alloa, Scotland, 13,895
Alma, Quebec, 13,309
Alma-Ata, U.S.S.R., 455,000
Almada, Portugal, 11,995
Almadén, Spain, 12,069
Almansa, Spain, 14,942
Almeirim, Portugal, 7,104
Almelo, Netherlands, 48,018
Almendralejo, Spain, †20,884
Almería, Spain, †86,808
Almora, India, 10,995
Alofi,* Niue, 884
Alor Star, Malaya, 52,929
Alsask, Sask., 232
Alsdorf, Germany, 30,957
Alta Gracia, Argentina, 11,570
Altagracia, Venezuela, 7,362
Altamira, Brazil, 2,939
Altamura, Italy, 38,231
Altan Bulak, Mongolia, 8,000
Altay (mountains), Asia

Altayskoye, U.S.S.R., 7,555
Altena, Germany, 24,007
Altenburg, Germany, 51,805
Altiplano (plateau), S.A.
Altona, Germany
Altona, Man., 1,698
Altoona, Pa., 69,407
Alty-Aryk, U.S.S.R., 5,706
Altyn Tagh (mt. range), China
Alula, Somali Rep., †2,175
Alvaro Obregón (Frontera), Mex., 8,320
Alwar, India, 54,143
Amadeus (lake), Australia
Amagasaki, Japan, 279,264
Amakusa (islands), Japan, 183,044
Amaliás, Greece, 15,468
Amalner, India, 34,694
Amami (islands), Japan, 105,534
Amapá, Brazil, 1,591
Amapala, Honduras, 2,944
'Amara, Iraq, 192,985
Amarante, Brazil, 3,199
Amarapura, Burma
Amarillo, Tex., 137,969
Amasya, Turkey, 28,188
Amatitlán, Guat., 7,116
Amazon (river), Brazil
Ambala, India, 105,507
Ambalavao, Malg. Rep., 4,186
Ambarawa, Indonesia, †48,768
Ambarchik, U.S.S.R.
Ambato, Ecuador, †78,760
Ambatondrazaka, Malg. Rep., 7,343
Amberg, Germany, 42,493
Ambodifototra, Malg. Rep., 1,105
Amboina (Ambon), Indonesia, 46,403
Ambositra, Malg. Rep., 10,666
Ambriz, Angola, 2,196
Ambrizete, Angola, 1,147
Ambunti, Terr. N.G.
Amderma, U.S.S.R.
Ameca, Mexico, 17,396
American Falls (res.), Idaho
Amersfoort, Neth., 66,403
Amery, Manitoba, 25
Amherst, Burma
Amherst, N.S., 10,788
Amherstburg, Ont., 4,452
Amiens, France, 87,126
Amman,* Jordan, 244,599
Amne Machin (mtn.), China
Amos, Quebec, 6,080
Amoy, China, 224,300
'Amran, Yemen, 5,000
Amravati, India, 137,847
Amreli, India, 25,485
Amritsar, India, 375,542
Amsterdam,* Neth., 871,188
Amstetten, Austria, 12,075
Amu-Dar'ya (river), U.S.S.R.
Amul, Iran, 22,251
Amundsen (gulf), N.W. Terrs.
Amuntai, Indonesia
Amur (river), Asia
Amurang, Indonesia

Amya, Burma
An Khe, S. Vietnam
An Najaf, Iraq, 35,000
An Nasiriya, Iraq, 81,015
An Uaimh (Navan), Ireland, 3,996
Anadyr', U.S.S.R.
Anadyr' (mt. range), U.S.S.R.
Anagni, Italy, 14,262
'Anaiza, Saudi Arabia, 20,000
Anakapalle, India, 29,249
Anantapur, India, 21,482
Anantnag, India, 11,985
Anápolis, Brazil, 18,350
Anatolia (plateau), Turkey
Añatuya, Arg., 9,310
Anchieta, Brazil, 1,535
Ancona, Italy, 68,501
Ancud, Chile, 7,390
Andaman (islands), India, 21,316
Anderlecht, Belgium, 94,003
Andermatt, Switz., 1,523
Andernach, Germany, 20,825
Anderson (river), N.W. Terrs.
Andheri, India, 38,493
Andizhan, U.S.S.R., 129,000
Andkhui, Afghan., 30,000
Andong, S. Korea, 53,685
Andorra la Vella,* Andorra, 1,100
Andria, Italy, 63,937
Andros (island), Bahamas, 7,136
Andújar, Spain, 22,906
Aneto (mountain), Spain
Anécho, Togo, 11,283
Ang Thong, Thai., 8,527
Angara (river), U.S.S.R.
Angarsk, U.S.S.R., 134,000
Angel (fall), Venezuela
Angermünde, Germany, 10,813
Angers, France, 93,838
Anglesey (island), Wales, 51,700
Angliers, Quebec, 488
Angmagssalik, Greenland, †612
Angora (Ankara),* Turkey, 646,151
Angoram, Terr. N.G.
Angoulême, France, 38,060
Angren, U.S.S.R., 55,000
Anguilla (island), W.I., 5,605
Aniva, U.S.S.R., 7,404
Ankang, China
Ankara,* Turkey, 646,151
Ankazoabo, Malg. Rep., 2,463
Anking, China, 105,300
Ankober, Ethiopia, 3,000
Ann Arbor, Mich., 67,340
Annaberg-Buchholz, Ger., 19,584
Annapolis,* Md., 23,385
Annapolis Royal, N.S., 800
Annecy, France, 30,196
Annobón (island), Fernando Po, 1,415
Annonay, France, 13,092
Annotto Bay, Jamaica, 3,538
Ansbach, Germany, 32,948
Anshan, China, 548,900
Anshun, China
Anson (bay), Australia

POPULATION OF THE WORLD

* designates capitals

† designates inclusion of suburbs

Ansŏng, S. Korea, 22,995
Antâkya, Turkey, 45,848
Antalaha, Malg. Rep., 8,361
Antalya, Turkey, 50,963
Antequera, Spain, 29,855
Antibes, France, 13,778
Anticosti (island), Quebec, 532
Antigonish, N.S., 4,344
Antigua, Guatemala, 10,996
Antigua (island), W.I., 53,209
Antilles, Greater (islands), 16,344,978
Antilles, Lesser (islands), 2,381,773
Antioch (Antâkya), Turkey, 45,848
Antioquia, Colombia, 3,998
Antofagasta, Chile, 87,860
António Enes, Moz., 11,979
Antsalova, Malg. Rep., 1,601
Antsirabe, Malg. Rep., 18,683
Antung, China, 360,000
Antwerp (Antwerpen), Belgium, 256,619
Anuradhapura, Ceylon, 12,287
Anyang, China, 124,900
Anyox, British Columbia
Anzhero-Sudzhensk, U.S.S.R., 116,000
Anzio, Italy, 9,084
Aomori, Japan, 202,211
Aoji-dong, N. Korea, 39,616
Aosta, Italy, 24,214
Aoulef, Algeria, 3,406
Apalachee (bay), Fla.
Apaporis (river), Colombia
Aparri, Phil. Islands, 10,125
Apatin, Yugoslavia, 15,088
Apeldoorn, Netherlands, 97,867
Apia,* W. Samoa, 18,153
Apizaco, Mexico, 15,622
Apolda, Germany, 33,439
Appalachian (mountains), U.S.
Apure (river), Venezuela
'Aqaba, Jordan, 9,228
Aqsu, China
Aquidauana, Brazil, 11,997
Aquila (L'Aquila), Italy, 24,843
Aquin, Haiti, 1,799
'Arab (river), Sudan
Arabian (desert), Egypt
Arabian (pen.)
Arabian (sea)
Aracaju, Brazil, 112,516
Aracati, Brazil, 11,016
Araçatuba, Brazil, 53,363
Arad, Rumania, 106,460
Aragona, Italy, 16,628
Araguaiana, Brazil, 568
Araguari, Brazil, 24,619
Araguaya (river), Brazil
Arak, Iran, 58,998
Arakan (mountains), Burma
Aral (sea), U.S.S.R.
Aral'sk, U.S.S.R.
Aran (island), Ireland
Aran (islands), Ireland
Aranjuez, Spain, 19,627
Aranyaprathet, Thai., 5,124
Araranguá, Brazil, 4,340
Araraquara, Brazil, 58,076
Ararat, Australia, 7,934
Ararat (mountain), Turkey
Arauca, Colombia, 2,028
Arauca (river), S.A.
Araxa, Brazil, 24,041
Arbela (Erbil), Iraq, 69,280
Arborfield, Sask., 579
Arborg, Man., 726
Arbroath, Scotland, 19,533
Arcachon, France, 13,931
Archangel, U.S.S.R., 256,000
Arcola, Sask., 560
Arcot, India, 16,583
Arctic Red River, N.W. Terrs., 140
Ardebil, Iran, 65,742
Ardistan, Iran, 5,868
Arecibo, P.R., 28,828
Areia Branca, Brazil, 8,904
Arendal, Norway, 11,324
Arequipa, Peru, †162,500
Arezzo, Italy, 39,213
Argenteuil, France, 53,513
Argentia, Newfoundland, 493
Argentino (lake), Argentina
Árgos, Greece, 16,712
Argostólion, Greece, 7,322
Argun (river), U.S.S.R.-China
Ariano Irpino, Italy, 11,442
Arica, Chile, 43,344
Arid (cape), Australia
Arinos (river), Brazil
Aripuanã (river), Brazil
Arkaig (lake), Scotland
Arkansas (river), U.S.
Arkhangel'sk (Archangel), U.S.S.R., 256,000
Arkhara, U.S.S.R., 2,147
Arles, France, 23,409
Arlon (Aarlen), Belgium, 13,421
Armadale, Australia, 1,970
Armavir, U.S.S.R., 111,000
Armentières, France, 18,691
Armidale, Australia, 12,875
Armstrong, British Col., 1,288
Armstrong Station, Ont., 375
Arnhem, Netherlands, 119,814
Arnhem (cape), Australia
Arnhem Land (region), Aust.
Arnhemia, Indonesia
Arnold, England, 26,809
Arnprior, Ont., 5,474
Arnsberg, Germany, 21,305
Arnstadt, Germany, 27,846
Arrah, India, 53,122
Arran (island), Scotland, 4,506
Arras, France, 32,298
Arrecifes, Argentina, 7,635
Arrowhead, British Col., 200
Artá, Greece, 16,899
Artem, U.S.S.R., 55,000
Artemisa, Cuba, 17,461
Artemovsk, U.S.S.R., 61,000
Artemovsk, U.S.S.R.
Artigas, Uruguay, 17,684
Artvin (Çoruh), Turkey, 7,908
Arua, Uganda, 4,645
Aruba (isl.), Neth. Ant., 57,347
Arucas, Canary Isls., Spain, †25,986
Aruppukkottai, India, 35,001
Arusha, Tanganyika, 10,038
Aruwimi (river), R.o.t. Congo
Arvi, India, 16,228
Arvida, Quebec, 14,460
Arvika, Sweden, 15,856
Arzamas, U.S.S.R., 19,203
Aš, Czech., 9,640
Asahikawa, Japan, 188,309
Asansol, India, 103,659
Asben (Aïr) (mts.), Niger
Asbest, U.S.S.R., 60,000
Asbestos, Quebec, 11,083
Ascension (island), 196
Aschaffenburg, Germany, 54,131
Aschersleben, Germany, 42,196
Ascoli Piceno, Italy, 29,657
Ascope, Peru, 3,762
Asenovgrad, Bulgaria, 20,920
Ashburton, New Zealand, 11,602
Ashburton (river), Australia
Ashcroft, British Columbia, 868
Ashern, Man., 333
Ashford, England, 27,962
Ashibetsu, Japan, 67,137
Ashikaga, Japan, 110,972
Ashington, England, 27,294
Ashiya, Japan, 57,050
Ashkhabad, U.S.S.R., 170,000
Ashmore (isls.), Australia
Ashqelon, Israel, 23,496
Asmara, Ethiopia, 132,000
Asnières, France, 72,035
Assab, Ethiopia, 8,000
Assen, Netherlands, 27,941
Assiniboia, Sask., 2,491
Assiniboine (river), Canada
Asterabad (Gurgan), Iran, 28,380
Asti, Italy, 38,412
Astorga, Spain, 13,952
Astrakhan', U.S.S.R., 294,000
Asunción,* Para., 204,085
Aswân, Egypt, 47,466
Asyût, Egypt, 117,067
Atacama (desert), S.A.
Atakpamé, Togo, 10,213
Atar, Mauritania, 4,019
Atbara, Sudan, 34,700
Atbara (river), Sudan
Atbasar, U.S.S.R., 6,746
Athabasca, Alta., 1,487
Athabasca (lake), Canada
Athabasca (river), Alberta
Athens,* Greece, †1,852,709
Athlone, Ireland, 9,624
Áthos (mountain), Greece
Atikokan, Ontario, 6,906
Atkarsk, U.S.S.R., 19,348
Atlanta,* Ga., 487,455
Atlas (mountains), Africa
Atlin, British Columbia
'Atlit, Israel, 1,750
Atlixco, Mexico, 30,433
Atotonilco, Mexico, 14,190
Attawapiskat (river), Ontario
Atuel (river), Argentina
Aubervilliers, France, 52,766
Auch, France, 11,489
Auckland, New Zealand, †448,365

*** designates capitals**

† designates inclusion of suburbs

Auden, Ontario, 444
Audincourt, France, 8,656
Aue, Germany, 25,567
Auerbach, Germany, 18,708
Augsburg, Germany, 208,659
Augusta, Australia, 280
Augusta, Ga., 70,626
Augusta, Italy, 22,107
Augusta,* Maine, 21,680
Augustów, Poland, 13,300
Aujila, Libya, 1,502
Aulnay-sous-Bois, France, 32,223
Aurangabad, India, 66,725
Auray, France, 8,038
Aurich, Germany, 12,979
Aurillac, France, 19,375
Austin,* Tex., 186,545
Austin (lake), Australia
Austral (Tubuai) (islands), Fr. Polynesia, 3,915
Australian Alps (mountains), Australia
Autlán, Mexico, 17,069
Autun, France, 11,767
Auxerre, France, 23,100
Avalon (peninsula), Newf.
Avarua,* Cook Islands, 270
Avdeyevka, U.S.S.R., 8,767
Aveiro, Portugal, 13,423
Avellaneda, Argentina, 329,626
Avellino, Italy, 28,597
Aversa, Italy, 33,809
Avezzano, Italy, 21,983
Avignon, France, 51,863
Ávila de los Caballeros, Spain, †26,807
Avion, France, 16,072
Avola, Br. Columbia, 97
Avola, Italy, 24,304
Avon (river), England
Avon (river), England
Avranches, France, 7,176
Awe (lake), Scotland
Ayabe, Japan, 52,310
Ayacucho, Peru, 21,454
Ayaguz, U.S.S.R., 30,000
Ayapel, Colombia, 2,436
Aydin, Turkey, 35,671
Aylesbury, England, 27,891
Aylmer (lake), N.W. Terrs.
Ayr, Australia, 8,010
Ayr, Scotland, 45,297
Ayre (point), Isle of Man
Aytos, Bulgaria, 9,972
Ayutthaya (Krung Kao), Thai., 15,821
Ayvalik, Turkey, 16,057
Azamgarh, India, 24,307
Azcapotzalco, Mexico, 63,857
Azogues, Ecuador, 6,579
Azores (islands), 336,933
Azov (sea), U.S.S.R.
Azua, Dominican Rep., 12,350
Azul, Argentina, 28,609

B

Baa, Indonesia
Ba'albek, Lebanon, 8,691
Baarn, Netherlands, 19,993
Babadag, Rumania, 5,549
Babaeski, Turkey, 11,692
Babahoyo, Ecuador, 9,045
Babelthuap (island), Palau Is., 3,672
Babol (Barfrush), Iran, 36,194
Babushkin, U.S.S.R., 112,000
Babushkin, U.S.S.R., 2,570
Babuyan (islands), Phil. Isls.
Bac Kan, N. Vietnam
Bac Lieu, S. Vietnam, 29,520
Bac Ninh, N. Vietnam
Bacabal, Brazil, 15,531
Bacău, Rumania, 54,138
Bacchus Marsh, Australia, 3,288
Back (river), N.W. Terrs.
Bačka Topola, Yugoslavia, 14,442
Backnang, Germany, 23,725
Bacolod, Philippine Isls., 119,169
Bácsalmás, Hungary, 9,542
Bad Godesberg, Germany, 65,119
Bad Homburg, Germany, 37,340
Bad Ischl, Austria, 12,698
Bad Kissingen, Germany, 12,865
Bad Kreuznach, Germany, 35,101
Bad Nauheim, Germany, 13,431
Bad Oldesloe, Germany, 15,988
Bad Reichenhall, Germany, 13,147
Bad Wildungen, Germany, 11,210
Badagara, India, 17,924
Badajoz, Spain, †96,317
Badalona, Spain, 40,983
Baden, Austria, 22,000
Baden, Switzerland, 13,949
Baden-Baden, Germany, 40,029
Badulla, Ceylon, 13,213
Badung (Denpasar), Indonesia, †52,000
Baena, Spain, 20,084
Baeza, Spain, 16,506
Baffin (bay), N.W. Terrs.
Baffin (island), N.W. Terrs.
Bafoulabé, Mali, 1,037
Bafra, Turkey, 20,788
Baft, Iran, 3,861
Bagalkot, India, 24,521
Bagamoyo, Tang., 5,000
Bagé, Brazil, 47,930
Baghdad,* Iraq, 558,820
Bagheria, Italy, 30,782

Baghlan, Afghanistan, 20,000
Bagnères de Bigorre, France, 8,499
Bagnolet, France, 25,059
Baguio, Philippine Islands, 50,331
Bahama (islands), 84,841
Bahawalnagar, Pakistan, 18,373
Bahawalpur, Pakistan, 84,000
Bahia (Salvador), Brazil, 630,878
Bahía, Ecuador, 7,993
Bahía Blanca, Argentina, 150,354
Bahraich, India, 39,963
Bahramabad, Iran, 9,212
Baia de Aramă, Rumania, 1,513
Baia Mare, Rumania, 35,920
Baidyabati, India, 25,825
Baie-Comeau, Quebec, 7,956
Baie-de-la-Trinité, Quebec, 968
Baie-Saint-Paul, Quebec, 4,674
Baikal (Baykal) (lake), U.S.S.R.
Baile Atha Cliath (Dublin), *Ireland, 539,476
Băileşti, Rumania, 15,932
Bairnsdale, Australia, 7,427
Bait al Faqih, Yemen, 12,000
Baja, Hungary, 30,355
Baja (Lower) California (pen.), Mexico, 604,346
Bakel, Senegal, 2,400
Baker (island), Pacific, 3
Baker (lake), N.W. Terrs.
Bakirköy, Turkey, 75,386
Baku, U.S.S.R., 636,000
Balagansk, U.S.S.R., 1,179
Balaghat, India, 11,482
Balakhna, U.S.S.R.
Balakhta, U.S.S.R., 3,027
Balashikha, U.S.S.R., 58,000
Balashov, U.S.S.R., 64,000
Balasore, India, 19,405
Balaton (lake), Hungary
Balboa, Canal Zone, 4,162
Balboa Heights,* Canal Zone, 363
Balcarce, Argentina, 15,210
Balclutha, New Zealand, 3,935
Bâle (Basel), Switz., 206,746
Balearic (Baleares) (islands), Spain, 443,327
Balhannah, Australia, 548
Bali (island), Indon., 1,707,994
Balikesir, Turkey, 61,012
Balikpapan, Indonesia, †68,461
Balkan (mountains), Bulgaria
Balkh, Afghanistan, 15,000
Balkhash, U.S.S.R., 53,000
Balkhash (lake), U.S.S.R.
Ballarat, Australia, †54,880
Ballia, India,. 23,520
Ballina, Australia, 4,129
Ballina, Ireland, 6,028
Ballinasloe, Ireland, 5,711
Bally, India, 102,285
Ballymena, N. Ireland, 14,740
Balmazújváros, Hungary, 18,769
Balrampur, India, 35,461
Balranald, Australia, 1,331

*** designates capitals**

† designates inclusion of suburbs

Bals, Rumania, 6,956
Baltic (sea), Europe
Baltimore, Md., 939,024
Bam, Iran, 15,737
Bamako,* Mali, 60,000
Bamberg, Germany, 74,115
Bamenda, Cameroon, 2,264
Ban Houei Sai, Laos
Ban Me Thuot, S. Vietnam, 20,430
Banana, R.o.t. Congo
Banbury, England, 20,996
Banco, Colombia, 5,626
Bancroft, Ontario, 2,615
Banda, India, 27,070
Banda (sea), Indonesia
Bandanaira, Indonesia
Bandar (Masulipatnam), India, 101,396
Bandar 'Abbas, Iran, 17,710
Bandar Maharani, Malaya, 39,050
Bandar Penggaram, Malaya, 40,016
Bandeira (peak), Brazil
Bandiagara, Mali, 3,700
Bandirma, Turkey, 28,858
Bandjarmasin, Indonesia, 188,523
Bandra, India, 71,789
Bandung, Indonesia, 913,528
Banes, Cuba, 20,257
Banff, Alta., 3,429
Banff (park), Alta., 4,101
Bangalore, India, 907,627
Bangassou, Central African Rep., 9,000
Banggai, Indonesia
Bangil, Indonesia, 34,112
Bangka (island), Indon., 290,861
Bangkahulu, Indonesia, 21,058
Bangkalan, Indonesia, †29,536
Bangkok,* Thailand, 1,089,800
Bangor, N. Ireland, 23,865
Bangor, Wales, 13,977
Bangued, Philippine Isls., 5,663
Bangui,* Central African Rep., 80,000
Bangui, Philippine Islands, 3,323
Bangweulu (lake), N. Rhodesia
Baní, Dominican Rep., 14,472
Bani (river), Mali
Banja Luka, Yugoslavia, 50,463
Banjumas, Indonesia, 6,686
Banjuwangi, Indonesia, 53,576
Banks (island), N.W. Terrs.
Banks (strait), Tas., Australia
Bankstown, Australia, 152,251
Bankura, India, 46,617
Bann (river), Ireland
Banningville, R.o.t. Congo, 3,947
Bannu, Pakistan, 27,199
Bansberia, India, 23,716
Banská Bystrica, Czech., 22,590
Banská Stiavnica, Czech., 10,381
Banswara, India, 12,772
Bantry (bay), Ireland
Bao Lac, N. Vietnam
Bar-le-Duc, France, 14,015
Barabinsk, U.S.S.R.
Baracoa, Cuba, 11,459

Baradero, Argentina, 10,194
Barahona, Dom. Rep., 20,398
Baramati, India, 16,366
Baramula, India, 12,724
Baranchinskiy, U.S.S.R., 9,500
Baranof (island), Alaska
Baranovichi (Baranowicze), U.S.S.R., 58,000
Barasat, India, 11,230
Barbacena, Brazil, 41,931
Barbacoas, Colombia, 3,349
Barbados (island), West Indies, 232,085
Barbuda (island), Antigua, 1,145
Barcaldine, Australia, 1,738
Barce (El Marj), Libya, 8,000
Barcellona Pozzo di Gotto, Italy, 23,685
Barcelona, Spain, †1,557,863
Barcelona, Venezuela, †42,267
Barcelos, Brazil, 1,094
Barcelos, Portugal, 7,875
Barcoo (Cooper's Creek) (river), Australia
Bardai, Chad
Bardera, Somali Rep., †7,134
Bardsey (island), Wales
Bareilly, India, 273,204
Barents (sea), Europe
Barfrush (Babol), Iran, 36,194
Barguzin, U.S.S.R., 2,263
Bari, Italy, 264,744
Baria, S. Vietnam, 11,410
Barinas, Venezuela, †25,895
Barisal, Pakistan, 89,278
Barisan (mountains), Indonesia
Barito (river), Indonesia
Barkly East, Cape of Good Hope, 3,648
Barkol, China
Bârlad, Rumania, 32,040
Barlee (lake), Australia
Barletta, Italy, 63,692
Barmer, India, 12,051
Barnagore, India, 107,542
Barnaul, U.S.S.R., 320,000
Barnet, England, 27,834
Barnsley, England, 74,650
Barnstaple, England, 15,907
Barnstaple (bay), England
Baroda, India, 295,304
Barotseland (region), N. Rhod.
Barpeta, India, 18,466
Barquisimeto, Venezuela, †199,691
Barra, Brazil, 5,737
Barra (islands), Scotland, 1,467
Barra do Corda, Brazil, 3,723
Barra Head (cape), Scotland
Barraba, Australia, 1,469
Barrackpore, India, 59,717
Barranca, Peru, 10,912
Barrancabermeja, Colombia, 25,046
Barranquilla, Colombia, †411,330
Barraute, Quebec, 1,199
Barreiras, Brazil, 7,175
Barreiro, Portugal, 22,190
Barretos, Brazil, 39,950
Barrhead, Alta., 2,286

Barrhead, Scotland, 14,422
Barrie, Ontario, 21,169
Barrow (island), Australia
Barrow (river), Ireland
Barrow-in-Furness, England, 64,824
Barry, Wales, 42,039
Barry's Bay, Ont., 1,439
Barsi, India, 36,870
Bartica, Br. Guiana, 2,352
Bartin, Turkey, 11,655
Barus, Indonesia, †35,716
Barwani, India, 12,569
Barwon (river), Australia
Basel, Switz., 206,746
Bashi (channel)
Basim, India, 17,928
Basingstoke, England, 80,856
Basirhat, India, 26,348
Basra, Iraq, 219,167
Bass (strait), Australia
Bassac, Laos
Bassano, Alta., 815
Bassano del Grappa, Italy, 18,834
Basse-Terre,* Guad., 11,837
Bassein, Burma, 77,382
Basseterre,* St. Kitts, 15,742
Bastia, France, 24,356
Bastogne (Bastenaken), Belg., 6,177
Bat Yam, Israel, 31,338
Batala, India, 44,458
Batan (islands), Philippine Isls., 10,705
Batang, China
Batang, Indonesia, 57,561
Batangas, Philippine Isls., 10,326
Batavia (Djakarta),* Indonesia, 1,992,999
Bath, England, 80,856
Bathgate, Scotland, 12,686
Bathurst, Australia, 16,938
Bathurst,* Gambia, 19,602
Bathurst, N.B., 5,494
Bathurst (island), Australia
Batley, England, 39,390
Batlow, Australia, 1,403
Baton Rouge,* La., 152,419
Battambang, Cambodia, 31,190
Batticaloa, Ceylon, 12,948
Battle Harbour, Lab., Newf., 106
Battleford, Saskatchewan, 1,627
Battonya, Hungary, 11,740
Batumi, U.S.S.R., 82,00
Baturadja, Indonesia, †26,706
Baturité, Brazil, 7,198
Baubau, Indonesia, 2,493
Bauchi, Nigeria, 10,000
Bauld (cape), Quebec
Bauru, Brazil, 85,237
Bautzen, Germany, 38,524
Bay Roberts, Newf., 1,328
Bayamo, Cuba, 20,178
Bayamón, P.R., 15,109
Baybay, Philippine Islands, 9,414
Bayburt, Turkey, 11,968
Bayeux, France, 9,077
Bayindir, Turkey, 11,343
Baykal (Baikal)(lake), U.S.S.R.
Baykonur, U.S.S.R.

Bayombong, Phil, Isls., †17,545
Bayonne, France, 26,897
Bayram-Ali, U.S.S.R.
Bayreuth, Germany, 61,835
Baza, Spain, 14,071
Beachport, Australia, 495
Beachy Headland (prom.), Eng.
Beardmore, Ontario, 1,305
Beatrice (cape), Australia
Beaufort West, C. of G. Hope, 16,323
Beaumont, Tex., 119,175
Beaune, France, 11,022
Beauséjour, Man., 1,770
Beauvais, France, 24,645
Beaver (river), Canada
Beawar, India, 36,720
Bebedouro, Brazil, 18,249
Bečej, Yugoslavia, 23,322
Bedford, England, 63,317
Bedlington Station, Eng., 29,373
Bedworth, England, 32,501
Będzin, Poland, 39,700
Beer Tuvya, Israel, 528
Beersheba, Israel, 43,158
Beeston and Stapleford, England, 56,720
Bega, Australia, 3,858
Begovat, U.S.S.R.
Behbehan, Iran, 29,886
Beira, Mozambique, 59,329
Beirut,* Lebanon, 183,738
Beit Dagon, Israel, 3,200
Beit Jala, Jordan, 3,710
Beit Lahm (Bethlehem), Jordan, 15,777
Beit Shean, Israel, 9,572
Beiuş, Rumania, 6,467
Beja, Portugal, 14,058
Békés, Hungary, 21,699
Békéscsaba, Hungary, 49,488
Bela Crkva, Yugoslavia, 9,803
Belawan, Indonesia
Belaya (river), U.S.S.R.
Belcher (islands), N.W. Terrs.
Belebey, U.S.S.R., 11,320
Belém, Brazil, 359,988
Belet Uen, Som. Rep., 8,515
Belfast,* N. Ireland, 416,094
Belfast (bay), N. Ireland
Belfort, France, 41,197
Belgard (Bialogard), Poland, 17,700
Belgaum, India, 126,727
Belgorod, U.S.S.R., 71,000
Belgorod-Dnestrovskiy, U.S.S.R., 7,766
Belgrade,* Yugoslavia, 587,899
Belitung (Billiton) (island), Indonesia, 97,447
Belize,* Br. Honduras, 32,824
Bell (island), Newf., 12,281
Bell (river), Quebec
Bell Island, Newf., 8,026
Bell Ville, Argentina, 15,796
Bella Coola, B.C., 350
Bellary, India, 56,148
Belle (island), Newf.
Belle-île (island), France, 4,670
Belle Isle (strait), Canada
Belleoram, Newfoundland, 577
Belleville, Ontario, 30,655
Bellinzona, Switz., 14,435
Belluno, Italy, 19,604
Bellville, C. of G. Hope, 27,386
Belmonte, Brazil, 7,897
Belo Horizonte, Brazil, 642,912
Belogorsk, U.S.S.R.
Belomorsk, U.S.S.R.
Beloretsk, U.S.S.R., 59,000
Belovo, U.S.S.R., 107,000
Beloye (lake), U.S.S.R.
Belozersk, U.S.S.R., 6,990
Belper, England, 15,563
Belyy, U.S.S.R., 6,882
Ben Lomond (mountain), Tas., Australia
Ben More Assynt (mountain), Scotland
Ben Nevis (mountain), Scotland
Ben Thuy, N. Vietnam
Ben Tre, S. Vietnam, 19,600
Benadir (region), Somali Rep.
Benares (Varanasi), India, 573,558
Benbecula (island), Scotland, 924
Bender Kassim (Bosaso), Somali Rep., 6,359
Bendigo, Australia, †40,327
Bendorf, Germany, 14,018
Benei Beraq, Israel, 47,080
Benevento, Italy, 34,405
Bengal (bay)
Benghazi,* Libya, 79,533
Bengkajang, Indonesia, †17,029
Bengkalis, Indonesia, †36,433
Bengkulu (Bangkahulu), Indon., 21,058
Benguela, Angola, 14,690
Beni (river), Bolivia
Beni-Abbès, Algeria, 1,900
Beni Suef, Egypt, 76,681
Beni Ulid, Libya, 30,000
Benin (bay), Nigeria
Benin City, Nigeria, 53,753
Benito, Man., 406
Benoni, Transvaal, †135,467
Bensheim, Germany, 24,060
Bentinck (island), Australia
Benue (river), Nigeria
Beo, Indonesia
Beograd (Belgrade),* Yugoslavia, 587,899
Beppu, Japan, 107,734
Berat, Albania, 14,374
Berber, Sudan, 16,550
Berbera, Somali Rep., 30,000
Berbérati, Cent. Afr. Rep.
Berchem-Ste.-Agathe, Belgium, 15,316
Berchtesgaden, Germany, 5,752
Berck, France, 10,059
Berdichev, U.S.S.R., 53,000
Berdyansk, U.S.S.R., 65,000
Berens (river), Man.
Berens River, Man., 158
Berettyóújfalu, Hungary, 11,377
Berezniki, U.S.S.R., 106,000
Berezovskiy, U.S.S.R., 16,500
Bergama, Turkey, 21,797
Bergamo, Italy, 95,651
Bergen (Mons), Belgium, 26,124
Bergen, Norway, 115,914
Bergen op Zoom, Neth., 33,855
Bergerac, France, 18,286
Bergisch Gladbach, Ger., 41,902
Berhampore, India, 41,558
Berhampur, India, 43,536
Bering (sea)
Berkeley, Calif., 111,268
Berlin,* East Germany, 1,110,016
Berlin, W. Germany, 2,197,607
Bermejo (river), Argentina
Bermuda (islands), 42,640
Bern (Berne),* Switz., 163,172
Bernau, Germany, 12,984
Bernburg, Germany, 53,367
Berndorf, Austria, 8,992
Beroun, Czech., 15,597
Berthierville, Quebec, 3,708
Berwick, Nova Scotia, 1,282
Berwick-on-Tweed, Eng., 12,166
Berwyn (mountains), Wales
Besançon, France, 61,139
Beşiktaş, Turkey, 91,065
Besni, Turkey, 11,170
Bethanie, S.W. Africa, 1,053
Bethlehem, Jordan, 15,777
Bethlehem, O.F.S., 24,176
Béthune, France, 20,521
Bettegiri (Gadag), India, 56,283
Bettiah, India, 30,309
Betul, India, 11,841
Beuel, Germany, 31,836
Beuthen (Bytom), Poland, 182,500
Beverley, Australia, 851
Beverley, England, 16,024
Beverwijk, Neth., 8,602
Bexhill-on-Sea, England, 28,926
Beykoz, Turkey, 45,801
Beyoğlu (Pera), Turkey, 214,362
Béziers, France, 58,814
Bezwada (Vijayavada), India, 233,634
Bhadrakh, India, 19,550
Bhadravati, India, 19,585
Bhadreswar, India, 27,673
Bhagalpur, India, 143,994
Bhamo, Burma
Bhandara, India, 19,708
Bharatpur. India, 35,541
Bhatinda, India, 24,833
Bhatkal, India, 10,718
Bhatpara, India, 147,725
Bhavnagar, India, 177,488
Bhawanipatna, India, 10,863
Bhera, Pakistan, 16,632
Bhilsa, India, 14,472
Bhilwara, India, 15,169
Bhimavaram, India, 21,049
Bhiwandi, India, 18,776
Bhiwani, India, 43,921
Bhopal, India, 225,460
Bhuj, India, 26,331
Bhusaval, India, 36,352
Biafra (bay), Africa
Biała Podlaska, Poland, 19,200
Białogard (Belgard), Poland, 17,700
Białystok, Poland, 120,800

Biancavilla, Italy, 17,770
Biarritz, France, 21,542
Bibai, Japan, 87,345
Biberach, Germany, 21,524
Bic, Quebec, 1,177
Bida, Nigeria, 50,000
Bidar, India, 20,514
Biel (Bienne), Switz., 59,216
Bielawa, Poland, 27,000
Bielefeld, Germany, 174,642
Biella, Italy, 39,438
Bielsko-Biała, Poland, 71,600
Bien Hoa, S. Vietnam, 33,820
Bienfait, Sask., 842
Bienne (Biel), Switz., 59,216
Big Beaver, Saskatchewan, 100
Big River, Saskatchewan, 896
Biga, Turkey, 8,767
Biggar, Saskatchewan, 2,702
Bighorn (mountains), Wyoming
Bighorn (river), U.S.
Bihać, Yugoslavia, 10,956
Bihar, India, 54,551
Bijapur, India, 48,968
Bijar, Iran, 7,920
Bijeljina, Yugoslavia, 15,682
Bijnor, India, 27,900
Bikaner, India, 150,494
Bikini (island), Marshall Is.
Bilaspur, India, 37,460
Bilbao, Spain, †297,942
Bilimbay, U.S.S.R., 4,435
Billericay, England, 43,380
Billiton (Belitung) (island), Indonesia, 97,447
Bilma, Niger, 1,100
Bilston, England, 33,077
Bimlipatam, India, 9,914
Bindjai, Indonesia, 45,006
Bingara, Australia, 1,485
Bingen, Germany, 20,210
Bingerville, Ivory Coast, 2,150
Binghamton, N.Y., 75,941
Bingöl (Çapakçur), Turkey, 8,517
Binh Dinh, S. Vietnam, 18,350
Bintuhan, Indon., 1,918
Binyamina, Israel, 2,950
Biograd, Yugoslavia, 2,115
Bir (Bhir), India, 15,222
Bira, U.S.S.R., 2,092
Bird (isl.), Australia
Birecik, Turkey, 13,123
Birjand, Iran, 13,934
Birkenhead, England, 141,683
Birmingham, Ala., 340,887
Birmingham,England, 1,105,651
Birobidzhan, U.S.S.R., 41,000
Birsk, U.S.S.R., 17,500
Birtle, Man., 846
Biryulevo, U.S.S.R., 2,018
Biscay (bay)
Bisceglie, Italy, 38,151
Bischofshofen, Austria, 8,286
Biscotasing, Ontario, 200
Bisert', U.S.S.R., 8,080
Bishop Auckland, England, 35,276
Bishops Falls, Newf., 3,393
Biskra, Algeria, 52,511
Bislig, Philippine Isls., 1,086
Bismarck,* N. Dak., 27,870
Bismarck (archipelago), Terr. N.G., 145,000
Bissagos (isls.), Port. Guinea, 9,763
Bissau,* Port. Guinea, 6,000
Bissett, Manitoba, 770
Bistriţa, Rumania, 20,292
Bitlis, Turkey, 16,562
Bitola (Bitolj), Yugo., 49,101
Bitonto, Italy, 35,122
Bitterfeld, Germany, 32,833
Bitterroot (mt. range), U.S.
Biwa (lake), Japan
Biysk, U.S.S.R., 146,000
Bizerte, Tunisia, 39,327
Bjelovar, Yugoslavia, 13,569
Björneborg (Pori), Finland, 54,024
Black (hills), United States
Black (sea)
Black (Schwarzwald) (forest), Germany
Black Diamond, Alberta, 1,043
Black River, Jamaica, 2,612
Black Rock (desert), Nevada
Black Volta (river), Africa
Blackall, Australia, 2,217
Blackburn, England, 106,114
Blackpool, England, 152,133
Blacktown, Australia, 86,295
Blackwater (river), Ireland
Blagodarnoye, U.S.S.R., 12,209
Blagoveshchensk, U.S.S.R., 94,000
Blagoyevgrad, Bulgaria, 14,066
Blaine Lake, Saskatchewan, 641
Blair Athol, Australia, 405
Blairmore, Alberta, 1,980
Blaj, Rumania, 8,731
Blanc (cape), Africa
Blanc (mountain), France
Blanca Peak (mountain), Colo.
Blanco (cape), Oregon
Blankenburg, Germany, 18,445
Blantyre and Limbe, Nyas., 24,380
Blasket (isls.), Ireland
Blaydon-on-Tyne, England, 30,615
Blaze (point), Australia
Blenheim, New Zealand, 11,956
Blida, Algeria, 30,170
Blind River, Ontario, 4,093
Blitar, Indonesia, 60,096
Bloemfontein,* O.F.S., †140,924
Blois, France, 24,352
Bloody Foreland (prom.), Ireland
Blora, Indonesia, 49,296
Bludenz, Austria, 11,108
Blue (mountains), U.S.
Blue Mountains, Aust., 28,119
Blue Mud (bay), Australia
Blue Nile (river), Africa
Blue River, Br. Columbia, 352
Bluefields, Nicaragua, 8,016
Bluff, New Zealand, 3,042
Blumenau, Brazil, 22,627
Blyth, England, 35,933
Bôa Vista, Brazil, 10,180
Bobbili, India, 22,090
Bobo-Dioulasso, Upper Volta, 50,000
Bobruysk, U.S.S.R., 97,000
Bôca do Acre, Brazil, 2,994
Bochnia, Poland, 11,800
Bocholt, Germany, 45,675
Bochum, Germany, 361,382
Bodaybo, U.S.S.R.
Bodensee (Constance) (lake)
Bodhan, India, 19,443
Bodjonegoro, Indonesia, †61,749
Bodö, Norway, 12,708
Boggeragh (mountains), Ireland
Bognor Regis, England, 28,144
Bogor, Indonesia, 117,886
Bogotá,* Colombia, †1,123,600
Bogra, Pakistan, 24,996
Boguchar, U.S.S.R., 7,958
Bohemian (forest)
Boileau (cape), Australia
Boise,* Idaho, 34,481
Boissevain, Manitoba, 1,303
Bojador (cape), Sp. Sahara
Boké, Guinea, 3,600
Bolama, Port. Guinea, 4,895
Bolangir, India, 11,105
Bolbeck, France, 10,238
Bolesławiec, Poland, 20,300
Bolívar, Argentina, 14,010
Bolívar, Colombia, 2,495
Bolívar (peak), Venezuela
Bolligen, Switz., 14,914
Bologna, Italy, 323,219
Bologoye, U.S.S.R., 10,863
Bol'shevik (island), U.S.S.R.
Bolsón de Mapimí (dep.), Mexico
Bolton, England, 160,877
Bolu, Turkey, 13,743
Bolus Head (cape), Ireland
Bolvadin, Turkey, 16,075
Bolzano, Italy, 67,859
Boma, R.o.t. Congo, 31,598
Bombala, Australia, 1,389
Bombay, India, †4,146,491
Bomu (river), R.o.t. Congo
Bonaire (island), Neth. Antilles, 5,812
Bonaventure, Que., 1,000
Bonavista, Newfoundland, 4,186
Bondoukou, Ivory Coast, 5,500
Bondowoso, Indonesia, †44,215
Bondy, France, 19,473
Bône, Algeria, 88,920
Bong Son, S. Vietnam
Bonin-Volcano (islands), Pacific, 146
Bonn,* West Germany, 143,850
Bonne Bay, Newfoundland, 509
Bonnyville, Alberta, 1,736
Bonthain, Indonesia, †48,289
Bontoc, Philippine Isls., 16,297
Boom, Belgium, 17,590
Boothia (gulf), N.W. Terrs.
Boothia (peninsula), N.W. Terrs.
Bootle, England, 82,829
Bor, Turkey, 13,253
Bor, Yugoslavia, 14,244
Borah Peak (mountain), Idaho
Borås, Sweden, 67,272

* designates capitals

† designates inclusion of suburbs

Borazjun, Iran, 10,233
Borba, Brazil, 1,030
Bordeaux, France, 250,306
Bordertown, Australia, 1,546
Borgerhout, Belgium, 50,143
Borisoglebsk, U.S.S.R., 54,000
Borisov, U.S.S.R., 59,000
Borlänge, Sweden, 26,334
Bornholm (island), Denmark, 48,217
Borovichi, U.S.S.R., 28,400
Borovskoye, U.S.S.R., 5,149
Bosanska Gradiška, Yugo., 5,348
Bosporus (Karadeniz) (strait), Turkey
Boston, England, 24,903
Boston,* Mass., 697,197
Botany, Australia, 28,904
Bothnia (gulf)
Botoşani, Rumania, 29,569
Bottrop, Germany, 111,548
Botucatu, Brazil, 33,878
Botwood, Newfoundland, 3,680
Bouaké, Ivory Coast, 45,000
Boucaut (bay), Australia
Bougainville (cape), Australia
Bougainville (island), Australia
Bougainville (island), Territory N.G., 37,000
Bougie, Algeria, 21,011
Bougouni, Mali, 2,265
Boulder, Australia, 5,773
Boulia, Australia, 179
Boulogne-Billancourt, France, 78,925
Boulogne-sur-Mer, France, 34,389
Boundary Peak (mountain), U.S.
Bourem, Mali, 1,732
Bourg, France, 21,169
Bourges, France, 45,372
Bourke, Australia, 3,001
Bourlamaque, Quebec, 3,344
Bournemouth, England, 153,965
Boutilimit, Mauritania, 35,000
Bow (river), Alta.
Bow Island, Alberta, 1,122
Bowen, Australia, 5,160
Bowling Green (cape), Australia
Boyne (river), Ireland
Bozen (Bolzano), Italy, 67,859
Bozüyük, Turkey, 9,197
Bra, Italy, 12,135
Bracebridge, Ontario, 2,927
Brackwede, Germany, 25,999
Bradford, England, 295,768
Braga, Portugal, 32,153
Bragado, Argentina, 16,104
Bragança, Brazil, 12,848
Bragança, Portugal, 8,250
Brahmaputra (river)
Braich-y-pwll (cape), Wales
Brăila, Rumania, 102,500
Braintree, England, 20,553
Brake, Germany, 15,939
Bralorne, Br. Columbia, 613
Branco (river), Brazil
Brandenburg, Germany, 84,752
Brandon (mountain), Ireland
Brandon, Manitoba, 28,166
Brandon and Byshottles, England, 19,531
Brandvlei, C. of G. Hope, 1,417
Brantford, Ontario, 55,201
Brasília,* Brazil, 180,000
Braşov, Rumania, 123,834
Bratislava, Czech., 242,091
Bratsk, U.S.S.R., 51,000
Braunau, Austria, 14,442
Braunschweig (Brunswick), Germany, 246,200
Brava (Barawa), Somali Rep., †7,160
Bravo (river), Mexico
Bray (Brí Chualann), Ireland, 11,680
Brazos (river), Texas
Brazzaville,* R.o. Congo, 63,023
Brčko, Yugoslavia, 12,290
Brebes, Indonesia, †72,971
Brecon Beacons (mt.), Wales
Breda, Netherlands, 101,781
Bregenz, Austria, 21,331
Breidha (fiord), Iceland
Brejo, Brazil, 3,084
Bremen, Germany, 564,517
Bremerhaven, Germany, 141,849
Brentwood, England, 51,959
Brescia, Italy, 141,808
Breslau (Wrocław), Poland, 429,200
Bressay (island), Scotland, 269
Brest, France, 100,793
Brest (Brześć-nad-Bugiem), U.S.S.R., 73,000
Brewarrina, Australia, 1,225
Brí Chualann (Bray), Ireland, 11,680
Bridgend, Wales, 13,646
Bridgeport, Conn., 156,748
Bridgetown,* Barbados, 11,304
Bridgewater, Nova Scotia, 4,497
Bridgwater, England, 25,582
Bridlington, England, 26,007
Bridlington (bay), England
Brighouse, England, 30,783
Bright, Australia, 803
Brighton, Australia, 20,337
Brighton, Australia, 41,302
Brighton, England, 162,757
Brindisi, Italy, 53,437
Brisbane, Australia, †621,550
Bristol, England, 436,440
Bristol (channel), England
Britstown, C. of G. Hope, 2,834
Britt, Ontario, 225
Brive-la-Gaillarde, France, 32,041
Brno (Brünn), Czech., 314,379
Broach, India, 55,810
Broad (sound), Australia
Broadstairs-Saint Peter's, Eng., 15,082
Brockville, Ontario, 17,744
Brod, Yugoslavia, 21,858
Brodeur (peninsula), N.W. Terrs.
Brodnica, Poland, 14,500
Broken Hill, Australia, 31,267
Broken Hill, N. Rhodesia, †6,472
Bromberg (Bydgoszcz), Poland, 231,500
Bromsgrove, England, 34,474
Bronnitsy, U.S.S.R., 3,797
Bronte, Italy, 19,202
Brooks, Alberta, 2,827
Brooks (mtn. range), Alaska
Brookton, Australia, 647
Broome, Australia, 1,222
Browse (island), Australia
Bruay, France, 31,664
Bruce (mountain), Australia
Bruce Mines, Ontario, 484
Bruchsal, Germany, 22,578
Bruck an der Mur, Austria, 16,101
Bruges (Brugge), Belg., 52,294
Brühl, Germany, 35,302
Brumado, Brazil, 7,054
Brunei,* Brunei, 9,704
Brunswick (bay), Australia
Brunswick (Braunschweig), Germany, 246,200
Brussels,* Belgium, †1,424,538
Brux (Most), Czech., 35,770
Bruxelles (Brussels),* Belgium, †1,424,538
Bryansk, U.S.S.R., 206,000
Brzeg, Poland, 22,200
Bucaramanga, Colombia, 184,670
Buccaneer (arch.), Australia
Buchan Ness (prom.), Scotland
Buchans, Newfoundland, 2,493
Bucharest (Bucureşti),* Rumania, 1,222,874
Buckhaven and Methil, Scotland, 21,104
Buckingham, Quebec, 7,421
Buckleboo, Australia, 118
Bucureşti (Bucharest),* Rumania, 1,222,874
Budapest,* Hungary, 1,807,299
Budaun, India, 52,077
Budennovsk (Prikumsk), U.S.S.R., 15,776
Budge-Budge, India, 32,394
Budszentmihály, Hungary, 12,008
Budweis (České Budějovice), Czech., 63,949
Buea, Cameroon, 3,000
Buenaventura, Colombia, 35,087
Buenos Aires,* Argentina, †6,762,629
Buenos Aires (lake), S.A.
Buffalo, N.Y., 532,759
Bug (river)
Buga, Colombia, 19,595
Bugul'ma, U.S.S.R., 61,000
Buguruslan, U.S.S.R., 17,646
Buhuşi, Rumania, 12,382
Buitenzorg (Bogor), Indonesia, 117,886
Bujalance, Spain, 14,589
Bujnurd, Iran, 19,253
Bukama, R.o.t. Congo, 300
Bukavu, R.o.t. Congo, 33,268
Bukhara, U.S.S.R., 69,000
Bukittinggi, Indonesia, 52,824
Bukoba, Tang., 2,500
Bula, Indonesia, †3,116

* designates capitals

† designates inclusion of suburbs

Bulagan, Mongolia, 10,000
Bulawayo, S. Rhodesia, †92,168
Buldan, Turkey, 10,431
Bulli, Australia, 3,997
Bulloo (lake), Australia
Bulloo (river), Australia
Bulo Burti, Somali Rep., †3,852
Bulolo, Terr. N.G., 1,689
Bulun, U.S.S.R.
Bulun Tokhoi, China
Bumba, R.o.t. Congo, 3,531
Bumiaju, Indonesia, †52,790
Bumthang, Bhutan
Buna, Papua
Bunbury, Australia, 13,186
Bundaberg, Australia, 22,799
Bundi, India, 20,846
Bungo (strait), Japan
Buraida, Saudi Arabia, 30,000
Burao, Somali Rep., 10,000
Burdur, Turkey, 25,372
Burdwan, India, 107,881
Burg, E. Germany, 27,088
Burgas, Bulgaria, 72,795
Burgdorf, Switzerland, 13,936
Burgeo, Newfoundland, 1,454
Burgos, Spain, †82,177
Burgsteinfurt, Germany, 12,241
Burhanpur, India, 53,987
Burin, Newfoundland, 1,144
Buriram, Thai., 6,581
Burketown, Australia, 79
Burks Falls, Ontario, 926
Burnie, Australia, 14,201
Burnley, England, 80,588
Burns Lake, Br. Columbia, 1,041
Burriana, Spain, 15,472
Bursa, Turkey, 153,574
Burton-on-Trent, England, 50,766
Buru (island), Indonesia, 16,018
Burujird, Iran, 49,186
Bury, England, 59,984
Bury Saint Edmunds, England, 21,144
Bushire, Iran, 16,172
Busselton, Australia, 3,495
Bussum, Neth., 39,710
Busto Arsizio, Italy, 50,356
Buta, R.o.t. Congo, 10,694
Butiaba, Uganda, 1,216
Butt of Lewis (prom.), Scotland
Butterworth, Malaya, 42,506
Butuan, Philippine Islands, 9,162
Buvaydy, U.S.S.R., 2,274
Buxton, England, 19,568
Buy, U.S.S.R.
Buynaksk, U.S.S.R., 10,923
Büyükada (Prinkipo), Turkey, 19,864
Buzău, Rumania, 47,595
Buzuluk, U.S.S.R., 55,000
Byala Slatina, Bulgaria, 9,357
Bydgoszcz (Bromberg), Poland, 231,500
Byrock, Australia, 89
Byron (cape), Australia
Bystrzyca-Kłodzka, Poland, 9,564
Bytom, Poland, 182,500

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Ca Mau, S. Vietnam, 10,710
Ca Mau (point), S. Vietnam
Cabaiguán, Cuba, 9,853
Cabanatuan, Philippine Is., 70,398
Cabinda, Angola, 46,284
Cabot (strait), Canada
Cabra, Spain, 15,026
Cabri, Saskatchewan, 711
Čačak, Yugoslavia, 18,049
Cáceres, Spain, †48,005
Cachoeira do Sul, Brazil, 38,661
Cachoeiro de Itapemirim, Brazil, 39,470
Cader Idris (mountain), Wales
Cadillac, Quebec, 1,077
Cádiz, Spain, †117,871
Cadiz (gulf), Spain
Cadomin, Alberta, 109
Caen, France, 62,887
Caernarvon (bay), Wales
Caerphilly, Wales, 36,008
Caetité, Brazil, 4,823
Cagayan, Philippine Is., 68,026
Cagliari, Italy, 135,658
Caguas, P.R., 32,015
Caha (mountains), Ireland
Cahors, France, 12,706
Cahul (Kagul), U.S.S.R., 7,375
Caibarién, Cuba, 22,657
Cairn Gorm (mountain), Scotland
Cairns, Australia, 25,204
Cairo (El Qahira),* U.A.R., 3,298,885
Cajamarca, Peru, 23,008
Cajazeiras, Brazil, 9,832
Calabar, Nigeria, 15,000
Calabozo, Venezuela, 15,738
Călafat, Rumania, 8,069
Calahorra, Spain, 13,003
Calais, France, 60,160
Calama, Chile, 26,166
Calamar, Colombia, 6,934
Calapan, Philippine Is., †32,989
Călărăşi, Rumania, 25,555
Calatayud, Spain, †17,940
Calcutta, India, †5,550,195
Caldas da Rainha, Port., 10,039

Caledon, C. of G. Hope, 4,323
Calf of Man (island)
Calgary, Alberta, 249,641
Calgary, Greater, Alta., 279,062
Cali, Colombia, †545,410
Calicut (Kozhikode), India 158,724
California (gulf), Mexico
Callander, Ontario, 6,164
Callao, Peru, †179,300
Callington, Australia, 167
Caltagirone, Italy, 35,976
Caltanissetta, Italy, 47,610
Caluire, France, 16,846
Calvinia, C. of G. Hope, 5,189
Camagüey, Cuba, 110,388
Camaná, Peru, 5,158
Camargo, Mexico, 18,850
Cambay, India, 34,941
Cambay (gulf), India
Camberwell, Australia, 99,353
Camborne, England, 26,090
Cambrai, France, 28,230
Cambridge, England, 95,358
Camden, Australia, 6,372
Camden, N. J., 117,159
Cametá, Brazil, 5,695
Camiri, Bolivia, 4,969
Camocim, Brazil, 10,788
Camooweal, Australia, 251
Campana, Argentina, 14,452
Campbell River, Br. Columbia, 3,737
Campbellford, Ontario, 3,478
Campbellpur, Pakistan, 17,671
Campbellton, N.B., 9,873
Campbelltown, Australia, †18,701
Campeche, Mexico, 44,426
Campeche (gulf), Mexico
Câmpina, Rumania, 18,680
Campina Grande, Brazil, 72,456
Campinas, Brazil, 179,797
Campo de Criptana, Spain, †14,608
Campo Grande, Brazil, 64,477
Campo Maior, Portugal, 8,086
Campobasso, Italy, 22,635
Campos, Brazil, 90,601
Câmpulung, Rumania, 18,880
Câmpulung Moldovenesc, Rumania 13,267
Camrose, Alberta, 6,939
Can Tho, S. Vietnam, 78,740
Cañada de Gómez, Argentina, 12,353
Canadian (river), U.S.
Çanakkale, Turkey, 19,484
Cananea, Mexico, 19,895
Canary (Canarias) (islands), Spain, 944,438
Canaveral (cape), Fla.
Canberra,* Australia, †56,449
Candia (Hērákleion), Greece, 63,458
Canea (Khaniá), Greece, 38,467
Canelones, Uruguay, 11,285
Cañete, Peru, 4,794
Canicatti, Italy, 30,239
Cankiri, Turkey, 20,009
Canmore, Alberta, 1,379

* designates capitals

† designates inclusion of suburbs

Canna (island), Scotland, 8
Cannanore, India, 34,649
Cannes, France, 40,540
Cannock, England, 42,186
Canora, Saskatchewan, 2,117
Canosa di Puglia, Italy, 34,044
Canso, Nova Scotia, 1,151
Cantabrian (Cantábrica) (mt. range), Spain
Canterbury, England, 30,376
Canton, China, 1,598,900
Canton, Ohio, 113,631
Canton (island), Phoenix Is., 61
Cantù, Italy, 18,759
Canuelas, Argentina, 5,614
Canutama, Brazil, 977
Cao Bang, N. Vietnam
Cap-Chat, Quebec, 2,035
Cap-Haïtien, Haiti, 27,538
Cap Saint Jacques (Vung Tau), S. Vietnam, 5,800
Capakçur (Bingöl), Turkey, 8,517
Cape Breton (island), N.S.
Cape Coast, Ghana, 41,000
Cape Town,* S. Afr., †731,484
Capreol, Ontario, 3,003
Caprivi Strip (region), S.W. Afr.
Capua, Italy, 14,380
Caquetá (river), Colombia
Carabanchel Bajo, Spain, 13,002
Carabelas, Argentina, 3,024
Caracal, Rumania, 19,082
Caracas,* Venezuela, †1,336,119
Carangola, Brazil, 11,896
Caransebeş, Rumania, 15,195
Caraquet, New Brunswick, 1,063
Caratinga, Brazil, 22,275
Carauarí, Brazil, 1,345
Caravelas, Brazil, 3,096
Carberry, Manitoba, 1,113
Carbonear, Newfoundland, 4,234
Carbonia, Italy, 41,187
Carcagente, Spain, 15,117
Carcassonne, France, 31,305
Carcross, Yukon, 176
Cárdenas, Cuba, 43,750
Cárdenas, Mexico, 12,344
Cardiff, Wales, 256,270
Cardigan (bay), Wales
Cardston, Alberta, 2,801
Cardwell, Australia, 320
Carei, Rumania, 16,780
Caribbean (sea)
Caribou (mountains), Br. Columbia
Carini, Italy, 16,115
Carleton Place, Ontario, 4,796
Carlingford (bay), N. Ireland
Carlisle, England, 71,112
Carlow, Ireland, 7,707
Carlsbad (Karlovy Vary), Czech., 42,819
Carlton, England, 38,790
Carlyle, Saskatchewan, 982
Carmacks, Yukon, 130
Carman, Manitoba, 1,930
Carmarthen, Wales, 13,249
Carmarthen (bay), Wales
Carmaux, France, 9,648
Carmelo, Uruguay, 11,923
Carmen, Mexico, 20,901
Carmen de Areco, Argentina, 4,411
Carmen de Patagones, Arg., 5,423
Carmona (Uige), Angola, 1,474
Carmona, Spain, 21,498
Carnarvon, Australia, 1,809
Carnarvon, C. of G. Hope, 3,762
Carnduff, Saskatchewan, 957
Carnsore (point), Ireland
Carolina, Brazil, 8,137
Caroline (isls.), Pacific, 36,980
Carora, Venezuela, 23,164
Carpentras, France, 11,044
Carpi, Italy, 20,363
Carrara, Italy, 27,225
Çarşamba, Turkey, 14,776
Carson City,* Nev., 5,163
Carson Sink (depr.), Nev.
Cartagena, Colombia, †167,980
Cartagena, Spain, †123,630
Cartago, Costa Rica, 18,612
Cartier, Ontario, 507
Cartwright, Labr., Newf., 493
Carúpano, Venezuela, 37,268
Casablanca, Morocco, 1,037,303
Casale Monferrato, Italy, 32,403
Cascade (mountains), U.S.
Cascais, Portugal, 7,887
Caserta, Italy, 43,247
Casino, Australia, 8,091
Casiquiare, Brazo (river), Venezuela
Caspian (sea)
Cassel (Kassel), Ger., 207,507
Cassino, Italy, 8,852
Castellammare del Golfo, Italy, 17,905
Castellammare di Stabia, Italy, 51,395
Castellón de la Plana, Spain, †62,493
Castelo Branco, Portugal, 13,056
Castelvetrano, Italy, 29,007
Casterton, Australia, 2,442
Castelford, England, 40,345
Castlegar, Br. Columbia, 2,253
Castlereagh (bay), Australia
Castor, Alberta, 1,025
Castres, France, 26,759
Castries,* St. Lucia, 17,505
Castro, Brazil, 9,249
Castro, Chile, 7,001
Castro del Río, Spain, 16,152
Castrovillari, Italy, 12,054
Cat (island), Bahamas, 3,201
Catacaos, Peru, 12,206
Cataguases, Brazil, 21,476
Catalão, Brazil, 6,088
Catamarca, Argentina, 49,291
Catanduva, Brazil, 37,307
Catania, Italy, 296,780
Cataño, Puerto Rico, 8,276
Catanzaro, Italy, 49,786
Catbalogan, Philippine Is., 34,837
Cateel, Philippine Is., 2,333
Caterham, England, 19,844
Cato (island), Australia
Catskill (mountains), N.Y.
Cauca (river), Colombia
Caucasus (mts.), U.S.S.R.
Caulfield, Australia, 74,859
Cauquenes, Chile, 17,836
Causapscal, Quebec, 3,463
Cava de'Tirreni, Italy, 27,625
Cavaillon, France, 9,412
Cavarzere, Italy, 10,097
Caviana (island), Brazil
Cavite, Philippine Is., 54,882
Cawnpore (Kanpur), India, 947,793
Caxias, Brazil, 19,092
Caxias do Sul, Brazil, 60,607
Cayambe, Ecuador, 7,364
Cayenne,* Fr. Guiana, 10,961
Cayey, Puerto Rico, 19,738
Cazombo, Angola, 2,212
Ceará (Fortaleza), Brazil, 354,942
Cebu, Philippine Is., 259,194
Cedar Rapids, Iowa, 92,035
Cedros (island), Mexico, 1,003
Cegléd, Hungary, 37,943
Ceglie Messapico, Italy, 16,194
Celaya, Mexico, 58,762
Celebes (island), Indonesia, 6,499,884
Celebes (sea)
Celica, Ecuador, 1,627
Celje, Yugoslavia, 25,572
Celle, Germany, 58,530
Central (mt. range), S.A.
Central Patricia, Ontario, 51
Ceres, C. of G. Hope, 6,173
Cerignola, Italy, 46,977
Cernăuti (Chernovtsy), U.S.S.R., 145,000
Cernavodă, Rumania, 8,802
Cerritos, Mexico, 9,849
Cerro de Pasco, Peru, 5,720
Cesena, Italy, 34,047
Cēsis, U.S.S.R., 8,748
Česká Lípa, Czech., 14,038
České Budějovice, Czech., 63,949
Český Těšín, Czech., 15,508
Cessnock, Australia, †35,281
Cetatea Albă (Belgorod-Dnestrovskiy), U.S.S.R., 7,766
Cetinje, Yugoslavia, 9,102
Cette (Sète), France, 29,914
Ceuta, Spain, 73,182
Cevennes (mt. range), France
Ceyhan, Turkey, 31,688
Ceylon (island), 6,657,339
Chacabuco, Argentina, 12,917
Chachapoyas, Peru, 6,901
Chaco (region), S.A.
Chad (lake), Africa
Chagos (arch.), Mauritius, 1,048
Chahbar, Iran, 1,800
Chaibasa, India, 13,052
Chaiyaphum, Thai., 6,446
Chake Chake, Pemba, Zanzibar, 7,167
Chalcis, Greece, 24,745
Chalk River, Ontario, 1,135
Challapata, Bolivia, 2,529
Chalon-sur-Saône, France, 29,851
Châlons-sur-Marne, France, 28,257

* designates capitals

† designates inclusion of suburbs

Chamartín de la Rosa, Spain, 64,874
Chambal (river), India
Chambéry, France, 28,872
Chambord, Quebec, 1,188
Chamdo, China
Champagne, Yukon, 30
Champdani, India, 31,833
Champigny-sur-Marne, France, 29,207
Champlain (lake)
Chanda, India, 35,730
Chandernagore, India, 47,785
Chandler, Quebec, 3,406
Changchih, China, 97,800
Changchow, China, 87,200
Changchow, China, 296,500
Changchun, China, 855,200
Changhwa, China
Changpeh, China
Changsha, China, 650,600
Changsong, S. Korea, 24,868
Changteh, China, 94,800
Changting, China
Channel-Port aux Basques, Newf., 4,141
Chanthaburi, Thailand, 6,711
Chao Phraya (river), Thailand
Chaochow, China, 101,300
Chaotung, China, 50,000
Chaoyang, China
Chapayevsk, U.S.S.R., 83,000
Chapleau, Ontario, 3,386
Chapra, India, 55,142
Charcas, Mexico, 9,058
Chardzhou, U.S.S.R., 66,000
Charenton-le-Pont, France, 20,891
Charikar, Afghanistan, 15,000
Charleroi, Belgium, 25,768
Charles (cape), Va.
Charleston, S.C., 65,925
Charleston,* W. Va., 85,796
Charleville, Australia, 5,154
Charleville, France, 19,454
Charlotte (harbor), Fla.
Charlotte, N.C., 201,564
Charlotte Amalie,* Virgin Is. (U.S.), 12,880
Charlottenburg, Germany
Charlottetown,* P.E.I., 18,318
Charlton (island), Canada
Charters Towers, Australia, 7,633
Chascomús, Argentina, 9,105
Château-Thierry, France, 7,939
Châteauroux, France, 34,016
Châtellerault, France, 20,764
Chatham, England, 48,989
Chatham, New Brunswick, 7,109
Chatham, Ontario, 29,826
Châtillon-sous-Bagneau, France, 12,281
Chattanooga, Tenn., 130,009
Chaudoc, S. Vietnam, 51,600
Chaumont, France, 16,945
Chauny, France, 9,206
Chaux-de-Fonds, La, Switz., 38,906
Chaves, Portugal, 11,286
Cheb, Czech., 20,590
Cheboksary, U.S.S.R., 83,000
Chefoo, China, 116,000
Cheju, S. Korea, 68,090
Cheju (island), S. Korea, 281,720
Chekhov, U.S.S.R., 7,846
Cheleken, U.S.S.R., 2,728
Chełm, Poland, 29,600
Chelmno, Poland, 15,700
Chelmsford, England, 49,810
Chelmsford, Ontario, 2,559
Chełmza, Poland, 13,400
Chelsea, Australia, 22,355
Cheltenham, England, 71,968
Chelyabinsk, U.S.S.R, 688,000
Chelyuskin (cape), U.S.S.R.
Chemnitz (Karl-Marx-Stadt), Germany, 286,016
Chenab (river), Pakistan
Chengchow, China, 594,700
Chengteh, China, 92,900
Chengtu, China, 856,700
Cher (river), France
Cherbourg, France, 35,246
Cherdyn', U.S.S.R., 3,884
Cheremkhovo, U.S.S.R., 123,000
Cherepovets, U.S.S.R., 92,000
Cheribon (Tjirebon), Indonesia, 135,984
Cherkassy, U.S.S.R., 83,000
Cherkessk, U.S.S.R., 41,000
Cherlak, U.S.S.R., 2,862
Chernigov, U.S.S.R., 89,000
Chernovtsy, U.S.S.R., 145,000
Chernyy Yar, U.S.S.R., 3,387
Chesapeake (bay), U.S.
Cheshunt, England, 35,297
Chester, England, 59,283
Chester-le-Street, England, 18,948
Chesterfield, England, 67,833
Chesterfield Inlet, N.W. Terrs.
Cheviot (hills)
Cheyenne,* Wyo., 43,505
Cheyenne (river), U.S.
Chhatarpur, India, 13,210
Chhindwara, India, 21,916
Chlang Dao, Thailand, 5,179
Chiangmai, Thailand, 60,942
Chiangrai, Thailand, 5,330
Chiari, Italy, 18,868
Chiavari, Italy, 19,087
Chiba, Japan, 241,615
Chicacole, India, 22,249
Chicago, Ill., 3,550,404
Chichagof (island), Alaska
Chichester, England, 20,118
Chichibu, Japan, 44,671
Chichicastenango, Guat., 1,623
Chiclana de la Frontera, Spain, 14,451
Chiclayo, Peru, 86,904
Chicoutimi, Quebec, 31,657
Chidambaram, India, 26,212
Chidley (cape), Newf.
Chieti, Italy, 29,394
Chigasaki, Japan, 56,895
Chihfeng, China, 430,000
Chihli (Po Hai) (gulf), China
Chihuahua, Mexico, 149,437
Chik Ballapur, India, 14,989
Chikmagalur, India, 15,383
Chilecito, Argentina, 6,121
Chillán, Chile, 66,771
Chilliwack, Br. Columbia, 8,259
Chiloé (island), Chile, 78,335
Chilpancingo, Mexico, 17,942
Chilwa (lake), Africa
Chimaltenango, Guatemala, 6,138
Chimbay, U.S.S.R., 5,720
Chimborazo (mountain), Ecuador
Chimbote, Peru, 63,970
Chimkent, U.S.S.R., 153,000
Chinabad, U.S.S.R., 1,704
Chinandega, Nicaragua, 13,146
Chinaz, U.S.S.R., 3,191
Chincha Alta, Peru, 19,614
Chinchow, China, 352,200
Chinde, Mozambique, 1,142
Chingford, England, 45,777
Chingleput, India, 17,829
Chinhae, S. Korea, 67,412
Chiniot, Pakistan, 39,042
Chinju, S. Korea, 86,867
Chinkiang, China, 201,400
Chinnamp'o, N. Korea, 82,162
Chinsura and Hooghly, India, 49,081
Chinwangtao, China, 186,800
Chioggia, Italy, 39,915
Chios, Greece, 24,053
Chiplun, India, 15,528
Chiquimula, Guatemala, 8,840
Chiquinquirá, Colombia, 10,143
Chirala, India, 27,086
Chirchik, U.S.S.R., 65,000
Chirmiri, India, 10,044
Chirpan, Bulgaria, 13,231
Chisinau (Kishinev), U.S.S.R., 214,000
Chistopol', U.S.S.R., 51,000
Chistyakovo, U.S.S.R., 92,000
Chita, U.S.S.R., 171,000
Chitaldroog, India, 14,528
Chitorgarh, India, 9,300
Chitre, Panama, 9,120
Chittagong, Pakistan, 363,000
Chittoor, India, 27,835
Chivilcoy, Argentina, 23,386
Chkalov (Orenburg), U.S.S.R., 260,000
Choch'iwŏn, S. Korea, 23,143
Choibalsan, Mongolia, 10,000
Choisy-le-Roy, France, 27,213
Chojnice, Poland, 19,700
Chokurdakh, U.S.S.R.
Cholet, France, 23,214
Cholula, Mexico, 12,820
Choluteca, Honduras, 11,464
Chomutov, Czech., 33,152
Chon Buri, Thailand, 18,743
Ch'ŏnan, S. Korea, 44,075
Ch'ŏngjin, N. Korea, 184,301
Chŏngju, N. Korea, 18,633
Ch'ŏngju, S. Korea, 92,342
Chŏnju, S. Korea, 188,726
Chonos, Los (arch.), Chile
Chorley, England, 34,262
Chorzów, Poland, 146,700
Choshi, Japan, 91,470

* designates capitals

† designates inclusion of suburbs

Chowkow, China, 85,500
Christchurch, England, 26,498
Christchurch, N.Z., †220,510
Christiansted, Virg. Isls., 5,137
Christmas (island), Australia, 3,099
Christmas (island), Pacific, 52
Chrudim, Czech., 15,514
Chrzanów, Poland, 20,000
Chu (river), U.S.S.R.
Chu Chua, Br. Columbia, 77
Chüanchow, China, 107,700
Chubut (river), Argentina
Chuchow, China, 127,300
Chukchi (sea), U.S.S.R.
Chulym (river), U.S.S.R.
Chumikan, U.S.S.R.
Chumphon, Thailand, 5,219
Ch'unch'ŏn, S. Korea, 83,008
Chunghsien, China
Ch'ungju, S. Korea, 68,624
Chungking, China, 1,772,500
Chur (Coire), Switzerland, 24,825
Churchill, Manitoba, 949
Churchill (cape), Man.
Churchill (river), Canada
Churu, India, 28,269
Chusovoy, U.S.S.R., 60,000
Chust, U.S.S.R.., 18,400
Ciechanów, Poland, 19,800
Ciego de Ávila, Cuba, 35,178
Ciénaga, Colombia, 24,358
Cienfuegos, Cuba, 57,991
Cieplice, Poland, 13,800
Cieszyn, Poland, 23,200
Cieza, Spain, 18,913
Cimarron (river), U.S.
Cincinnati, Ohio, 502,550
Cinto (mountain), Corsica, France
Cittanova, Italy, 13,680
Ciudad Bolívar, Venezuela, †64,133
Ciudad de las Casas (San Cristóbal), Mexico, 23,355
Ciudad García, Mexico, 14,948
Ciudad Guzmán, Mexico, 30,971
Ciudad Juárez, Mexico, 261,683
Ciudad Madero, Mexico, 53,526
Ciudad Mante (Juárez), Mexico, 22,701
Ciudad Obregón, Mexico, 68,010
Ciudad Real, Spain, †37,081
Ciudad Serdán, Mexico, 9,584
Ciudad Trujillo (Santo Domingo),* Dom. Rep., 367,053
Ciudad Victoria, Mexico, 50,727
Civitavecchia, Italy, 29,165
Clacton-on-Sea, England, 27,543
Clamart, France, 32,638
Clanwilliam, C. of G. Hope, 2,214
Clare (island), Ireland
Claremont, Australia, 8,601
Clarence (strait), Australia
Clarenville, Newfoundland, 1,541
Claresholm, Alberta, 2,143
Clarke City, Quebec, 834
Clausthal-Zellerfeld, Germany, 15,245

Clear (cape), Ireland
Clear (lake), Calif.
Clearwater (lake), Quebec
Cleethorpes, England, 32,705
Clermont, Australia, 1,737
Clermont-Ferrand, France, 97,084
Cleveland, Ohio, 876,050
Cleves (Kleve), Germany, 21,483
Clew (bay), Ireland
Clichy, France, 52,652
Climax, Saskatchewan, 425
Clipperton (island), Fr. Polynesia
Clogher, N. Ireland, 10,687
Cloncurry, Australia, 2,438
Clonmel, Ireland, 10,617
Cluj, Rumania, 154,723
Clyde (firth), Scotland
Clyde (river), Scotland
Clydebank, Scotland, 49,654
Coalville, England, 26,159
Coamo, Puerto Rico, 12,146
Coast (mountains), Br. Columbia
Coast (mt. range), U.S.
Coatbridge, Scotland, 53,946
Coatepec, Mexico, 18,081
Coatepeque, Guatemala, 6,281
Coaticook, Quebec, 6,906
Coats (island), N.W. Terrs.
Coatzacoalcos (Puerto México), Mexico, 36,989
Cobalt, Ontario, 2,209
Cobán, Guatemala, 7,911
Cobar, Australia, 2,178
Cobh, Ireland, 5,266
Coblenz (Koblenz), Germany, 99,240
Cobourg, Ontario, 10,646
Cobourg (peninsula), Australia
Coburg, Australia, 70,771
Coburg, Germany, 44,237
Cocanada (Kakinada), India, 122,655
Cochabamba, Bolivia, 91,017
Cochin, India, 26,320
Cochrane, Ontario, 4,521
Cockburn, Australia, 131
Cocos (island), C.R.
Cocos (Keeling) (islands), Australia, 606
Cocula, Mexico, 10,148
Cod (cape), Mass.
Codajás, Brazil, 1,505
Codó, Brazil, 11,089
Coe Hill, Ontario, 288
Coeur d'Alene (lake), Idaho
Coff's Harbour, Australia, 7,188
Cognac, France, 16,843
Coimbatore, India, 285,263
Coimbra, Portugal, 41,977
Coire (Chur), Switzerland, 24,825
Cojímar, Cuba, 1,846
Cojutepeque, El Salvador, 11,617
Colchester, England, 65,072
Coleman, Alberta, 1,713
Coleraine, Australia, 1,503
Coleraine, N. Ireland, 11,912
Colima, Mexico, 44,860
Coll (island), Scotland, 210
Collie, Australia, 7,547
Collier (bay), Australia
Collingwood, New Zealand, 167

Collingwood, Ontario, 8,385
Collinsville, Australia, 2,122
Colmar, France, 43,514
Colne, England, 19,410
Cologne (Köln), Germany, 809,247
Colomb-Béchar, Algeria, 10,827
Colombes, France, 60,997
Colombo,* Ceylon, 423,481
Colón, Cuba, 15,755
Colón, Panama, 59,598
Colonia, Uruguay, 9,825
Colonsay (island), Scotland, 227
Colorado (river), Argentina
Colorado (river), U.S.
Colorado (river), Texas
Colorado Sprs., Colo., 70,194
Columbia,* S.C., 97,433
Columbia (river), Br. Columbia
Columbia (river), U.S.
Columbus, Ga., 116,779
Columbus,* Ohio, 471,316
Colwyn Bay, Wales, 23,090
Comalapa, Guat., 7,404
Comayagua, Honduras, 8,456
Comeragh (mountains), Ireland
Comilla, Pakistan, 47,195
Comiso, Italy, 24,561
Comitán, Mexico, 15,378
Communism (mt.), U.S.S.R.
Como, Italy, 65,390
Comodoro Rivadavia, Arg., 25,651
Comoé (river), Ivory Coast
Comorin (cape), India
Comoro (islands), 183,133
Compiègne, France, 17,701
Conakry,* Guinea, 38,000
Conceição do Araguaia, Brazil, 2,332
Concepción, Argentina, 12,338
Concepción, Chile, 148,015
Concepción, Paraguay, 20,642
Concepción del Uruguay, Argentina 31,498
Conception (point), Calif.
Conchas (reservoir), N. Mex.
Conchos (river), Mexico
Concord,* N.H., 28,991
Concordia, Argentina, 52,213
Condobolin, Australia, 3,150
Conegliano, Italy, 11,549
Congleton, England, 16,802
Congo (river), Africa
Coniston, Ontario, 2,692
Conjeeveram (Kanchipuram), India, 74,635
Conn (lake), Ireland
Consett, England, 38,927
Constance (lake)
Constance (Konstanz), Germany, 52,651
Constanța, Rumania, 99,676
Constantina, Spain, 11,773
Constantine, Algeria, 118,774
Constantinople (Istanbul), Turk., 1,459,528
Constitución, Chile, 9,536
Consul, Saskatchewan, 172
Contamana, Peru, 4,821
Conversano, Italy, 15,050

* designates capitals

† designates inclusion of suburbs

Cooch Behar, India, 16,000
Cook (islands), Pacific, 14,088
Cooktown, Australia, 448
Coolangatta, Australia, 2,343
Coolgardie, Australia, 625
Cooma, Australia, 8,716
Coonamble, Australia, 3,235
Coondapur, India, 9,537
Cooper's (creek), Australia
Cootamundra, Australia, 5,939
Copenhagen (København), *Denmark, 721,381
Copiapó, Chile, 30,123
Copley, Australia, 95
Copper Cliff, Ontario, 3,600
Coppermine, N.W. Terrs., 206
Coppermine (river), N.W. Terrs.
Coquet (river), England
Coquilhatville, R.o.t. Congo, 37,587
Coquimbo, Chile, 33,749
Corabia, Rumania, 11,502
Coracora, Peru, 6,500
Coral (sea), Pacific
Corato, Italy, 44,601
Corbeil, France, 10,797
Córdoba, Argentina, †589,153
Córdoba, Mexico, 47,390
Córdoba, Spain, †198,148
Corfu, Greece, 26,991
Corigliano Calabro, Italy, 17,396
Coringa (isls.), Australia
Corinth, Greece, 15,892
Corinthia (gulf), Greece
Corio, Australia, 12,998
Cork, Ireland, 77,860
Cork (harbor), Ireland
Corleone, Italy, 16,161
Çorlu, Turkey, 21,951
Corner Brook, Newf., 25,185
Corno (mountain), Italy
Cornwall, Ontario, 43,639
Coro, Venezuela, †45,368
Corocoro, Bolivia, 4,431
Coroico, Bolivia, 2,235
Coronation, Alberta, 784
Coronation (gulf), Canada
Coronel Brandsen, Arg., 3,803
Coronel Pringles, Arg., 12,844
Coronel Suárez, Arg., 11,133
Corpus Christi, Tex., 167,690
Corpus Christi (bay), U.S.
Corrib (lake), Ireland
Corrientes, Argentina, †112,725
Corrientes (cape), Colombia
Corrientes (cape), Mexico
Corrigin, Australia, 681
Corsica (Corse) (island), France, 165,000
Cortona, Italy, 8,744
Çoruh (Artvin), Turkey, 7,908
Çorum, Turkey, 34,629
Corumbá, Brazil, 36,744
Coruña, La, Spain, †177,502
Cosenza, Italy, 48,172
Cosmoledo (islands), Seychelles, 57
Cotabato, Philippine Is., 37,320
Cotonou, Dahomey, 23,000
Cotopaxi (mountain), Ecuador
Cotswold (hills), England
Cottbus (Kottbus), Germany, 49,131
Cottesloe, Australia, 7,827
Courbevoie, France, 54,025
Courtenay, Br. Columbia, 3,485
Courtrai, Belgium, 43,070
Coutts, Alberta, 469
Coventry, England, 305,060
Covilhã, Portugal, 20,423
Cowan (lake), Australia
Cowdenbeath, Scotland, 11,918
Cowes, England, 16,975
Cowra, Australia, 6,288
Coxim, Brazil, 1,371
Coyoacán, Mexico, 54,866
Cozumel (island), Mexico, 2,905
Cracow (Kraków), Poland, 479,000
Cradle (mountain), Australia
Cradock, C. of G. Hope, 19,476
Craik, Saskatchewan, 606
Craiova, Rumania, 96,897
Cranbrook, Br. Columbia, 5,549
Crateús, Brazil, 14,572
Crato, Brazil, 27,649
Cree (lake), Canada
Creil, France, 9,476
Crema, Italy, 22,698
Cremona, Italy, 59,149
Creston, Br. Columbia, 2,460
Crete (island), Greece, 483,075
Crewe, England, 53,394
Crimea (pen.), U.S.S.R.
Crimmitschau, Germany, 30,504
Croker (island), Australia, 47
Cromarty (inlet), Scotland
Cronulla, Australia, 7,330
Crook and Willington, England, 25,218
Cross (lake), Manitoba
Cross Fell (mountain), England
Crotone, Italy, 30,788
Croydon, Australia, 127
Croydon, England, 252,387
Cruz Alta, Brazil, 33,190
Cruz del Eje, Argentina, 15,563
Cruzeiro do Sul, Brazil, 3,824
Csepel, Hungary, 46,171
Csongrád, Hungary, 20,690
Cua Rao, N. Vietnam
Cuanza (river), Angola
Cuba (island), 5,829,029
Cuckfield, England, 20,113
Cúcuta, Colombia, 131,140
Cuddalore, India, 60,632
Cuddapah, India, 28,246
Cudgewa, Australia, 257
Cudworth, Saskatchewan, 628
Cue, Australia, 299
Cuenca, Ecuador, †72,760
Cuenca, Spain, †27,007
Cuernavaca, Mexico, 35,824
Cufra (Kufra) (oasis), Libya, 4,600
Cuiabá, Brazil, 43,112
Cuillin (sound), Scotland
Cuito (river), Angola
Culgoa (river), Australia
Culiacán, Mexico, 84,602
Cullera, Spain, 14,214
Culver (point), Australia
Cumaná, Venezuela, †69,630
Cumberland (islands), Australia
Cumberland (sound), N.W. Terrs.
Cumbum, India, 22,177
Çumra, Turkey, 7,089
Cunene (river), Africa
Cuneo, Italy, 27,902
Cunnamulla, Australia, 2,234
Ćuprija, Yugoslavia, 11,406
Curaçao (island), Neth. Antilles, 125,181
Curacautín, Chile, 9,601
Curepipe, Maur., 27,468
Curitiba, Brazil, 138,178
Curtea de Argeş, Rumania, 10,764
Curtis (island), Australia
Curuzú Cuatiá, Arg., 15,440
Cuttack, India, 146,590
Cuvier (cape), Australia
Cuxhaven, Germany, 44,123
Cuyuni (river), S.A.
Cuzco, Peru, †103,100
Cyclades (islands), Greece, 99,959
Cygnet, Australia, 830
Cyprus (island), 450,114
Cyrene (Shahat), Libya, 494
Czechowice, Poland, 21,500
Czeladź, Poland, 28,300
Częstochowa, Poland, 163,800

D

Da Nang, S. Vietnam, 100,978
Dąbrowa Górnicza, Poland, 41,800
Dabhoi, India, 21,139
Dabola, Guinea, 3,788
Dabou, Ivory Coast, 4,500
Dacca, Pakistan, 558,000
Dachau, Germany, 29,068
Dadu, Pakistan, 13,716
Dăeni, Rumania, 4,015
Daet, Phil. Islands, 35,571
Dagabur, Ethiopia, 2,000
Dagana, Senegal, 4,132
Daimiel, Spain, †19,625
Dairen (incl. in Lüta), China, 766,400
Daito (islands), Pacific, 4,396

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† designates inclusion of suburbs

Dajarra, Australia, 184
Dakar,* Senegal, 374,700
Dalat, S. Vietnam, 23,744
Dalby, Australia, 7,400
Dalhousie, N.B., 5,856
Dallas, Tex., 679,684
Daloa, Ivory Coast, 18,000
Daltonganj, India, 13,943
Daly (river), Australia
Damão, India, 9,027
Damaraland (region), S.W. Afr.
Damascus,* Syria, 529,579
Damba, Angola, 1,367
Damghan, Iran, 8,909
Damietta, Egypt, 71,132
Damoh, India, 26,795
Dampier (arch.), Australia
Dampier Land (peninsula), Australia
Dandenong, Australia, 24,909
Daniels Harbour, Newf., 257
Dannevirke, New Zealand, 5,508
Dansalan, Phil. Islands, 4,882
Dante (Hafun), Somali Rep., 2,000
Danube (delta)
Danube (Donau, Dunav) (river)
Danzig (Gdańsk), Poland, 286,500
Dar es Salaam,* Tang., 128,742
Darab, Iran, 9,106
Darabani, Rumania, 11,379
Darbhanga, India, 103,106
Dardanelles (strait), Turkey
Darende, Turkey, 6,945
Darganata, U.S.S.R.
Dargaville, New Zealand, 3,733
Darien (gulf), S.A.
Darjeeling, India, 25,873
Darling (mountain range), Aust.
Darling (river), Australia
Darlington, England, 84,162
Darmstadt, Germany, 136,412
Dartmoor (plateau), England
Dartmouth, N.S., 46,966
Daru, Papua, 237
Darwin, Australia, 12,326
Dashan (mountain), Ethiopia
Datia, India, 22,086
Daugavpils, U.S.S.R., 65,000
Daulatabad (Malayer), Iran, 19,749
Dauphin, Manitoba, 7,374
Davangere, India, 31,759
Davao, Philippine Islands, 231,833
Davenport, Iowa, 88,981
David, Panama, 22,924
Davidson, Saskatchewan, 928
Davis (strait)
Davos (Dorf and Platz), Switz., 9,588
Dawa (river), Ethiopia
Dawson, Yukon, 881
Dawson Creek, British Columbia, 10,946
Dax, France, 12,551
Daysland, Alta., 539
Dayton, Ohio, 262,332
De Aar, C. of G. Hope, 14,357

D'Entrecasteaux (islands), Papua, 35,000
D'Entrecasteaux (point), Aust.
De Grey (river), Australia
Dead (sea)
Deal, England, 24,791
Deán Funes, Argentina, 13,840
Dease (strait), Canada
Death Valley (depr.), Calif.
Deauville, France, 5,438
Debal'tsevo, U.S.S.R., 13,112
Dębica, Poland, 15,600
Dęblin, Poland, 12,500
Debra Markos, Ethiopia, 10,000
Debra Tabor, Ethiopia, 9,000
Debrecen, Hungary, 129,671
Decatur, Ill., 78,004
Decazeville, France, 10,751
Deccan (plateau), India
Děčín, Czechoslovakia, 39,443
Dédougou, Upper Volta, 3,924
Dee (river), England
Dee (river), Scotland
Deer Lake, Newfoundland, 3,998
Deggendorf, Germany, 17,082
Dehra Dun, India, 158,599
Dej, Rumania, 19,281
Delagoa (bay), Moz.
Delft, Netherlands, 74,120
Delgado (cape), Moz.
Delhi, India, †2,051,622
Delisle, Saskatchewan, 508
Delitzsch, Germany, 25,148
Delmenhorst, Germany, 57,336
Deloraine, Australia, 1,931
Deloraine, Manitoba, 916
Demak, Indonesia, 8,783
Demavend (mountain), Iran
Dembidollo, Ethiopia, 8,000
Demirci, Turkey, 8,738
Demmin, Germany, 18,006
Den Helder, Netherlands, 46,102
Denain, France, 22,299
Dendermonde (Termonde), Belgium, 9,825
Deniliquin, Australia, 5,575
Denizli, Turkey, 49,042
Denpasar, Indonesia, †52,000
Denver,* Colo., 493,887
Deoghar, India, 19,792
Deoria, India, 15,198
Dera Ghazi Khan, Pak., 35,909
Dera Ismail Khan, Pak., 41,613
Dérac, Haiti, 4,767
Derbent, U.S.S.R., 27,476
Derby, Australia, 994
Derby, England, 132,325
Derg (lake), Ireland
Derna, Libya, 15,218
Derryveagh (mt. range), Ireland
Derventa, Yugo., 9,133
Derwent (river), England
Des Moines,* Iowa, 208,982
Deseado (river), Argentina
Desna (river), U.S.S.R.
Desolación (island), Chile
Dessalines, Haiti, 3,745
Dessau, Germany, 92,455
Dessye, Ethiopia, 36,000
Detmold, Germany, 31,236
Detroit, Mich., 1,670,144

Deurne, Belgium, 66,482
Deutsch Brod (Havlíčkuv Brod), Czech., 14,944
Deva, Rumania, 16,879
Dévaványa, Hungary, 12,721
Develi, Turkey, 13,680
Deventer, Netherlands, 52,578
Devils (Diable) (island), French Guiana
Devlali, India, 16,292
Devon (island), N.W. Terrs.
Devonport, Australia, 13,068
Dewas, India, 22,949
Dewsbury, England, 52,942
Dezhnev (East) (cape), U.S.S.R.
Dhahran, Saudi Arabia, 10,000
Dhamar, Yemen, 5,000
Dhamtari, India, 14,071
Dhar, India, 22,015
Dharamsala, India, 9,653
Dharwar, India, 47,992
Dholpur, India, 21,311
Dhond, India, 12,828
Dhoraji, India, 37,647
Dhubri, India, 12,699
Dhulia, India, 54,406
Diable (Devils) (island), French Guiana
Diamantina (river), Australia
Diamantina, Brazil, 14,252
Diamantino, Brazil, 645
Dibrugarh, India, 23,191
Didsbury, Alta., 1,254
Didymóteikhon, Greece, 7,287
Diego Garcia (island), Mauritius, 619
Diégo-Suarez, Malg. Rep., 28,772
Dien Bien Phu, N. Vietnam
Dieppe, France, 25,983
Differdange, Lux., 17,570
Digby, N.S., 2,308
Dijon, France, 106,267
Dikson, U.S.S.R.
Dikwa, Nigeria, 5,242
Dili,* Port. Timor, 1,795
Dimbokro, Ivory Coast, 11,000
Dimishq (Damascus),* Syria, 529,579
Dimitrovo, Bulgaria, 59,721
Dinajpur, Pakistan, 34,271
Dinan, France, 11,111
Dinaric Alps (mt. range), Yugo.
Dindigul, India, 56,275
Dingle (bay), Ireland
Dinguiraye, Guinea, 2,914
Diomede (isls.)
Diósgyőr, Hungary, 26,538
Diourbel, Senegal, 28,560
Dire Dawa, Ethiopia, 20,000
Diriamba, Nicaragua, 7,561
Dirk Hartog (island), Australia
Dirranbandi, Australia, 889
Dirschau (Tczew), Poland, 32,900
Disappointment (cape), Wash.
Disappointment (lake), Australia
Discovery (bay), Australia
Disko (island), Greenland
Diu, India, 5,215

Divinópolis, Brazil, 41,544
Divnoye, U.S.S.R., 7,127
Dixon Entrance (strait)
Diyarbakir, Turkey, 80,645
Dizful, Iran, 52,121
Djailolo, Indonesia, †10,170
Djakarta,* Indonesia, 1,992,999
Djakovica, Yugoslavia, 17,065
Djakovo, Yugoslavia, 9,573
Djambi, Indonesia, 86,419
Djapara, Indonesia, †54,025
Djatinegara, Indonesia
Djelfa, Algeria, 6,212
Djember, Indonesia, 20,222
Djenné, Mali, 5,000
Djerid (lake), Tunisia
Djibouti,* Fr. Somaliland, 17,500
Djiring, S. Vietnam
Djokjakarta, Indonesia, 289,422
Djombang, Indonesia, †57,370
Djougou, Dahomey, 5,446
Dneprodzerzhinsk, U.S.S.R., 194,000
Dnepropetrovsk, U.S.S.R., 658,000
Dnieper (Dnepr) (river), U.S.S.R.
Dniester (Dnestr) (river), U.S.S.R.
Döbeln, Germany, 28,841
Dobrich (Tolbukhin), Bulgaria, 42,815
Dodecanese (islands), Greece, 123,021
Dodoma, Tang., 13,445
Doetinchem, Netherlands, 17,692
Dog Creek, British Columbia, 35
Doha,* Qatar, 26,000
Dohad, India, 12,666
Dolbeau, Quebec, 6,052
Dôle, France, 19,785
Dolinsk, U.S.S.R., 22,295
Dolisie, R.o. Congo, 7,495
Dolo, Ethiopia, 400
Dolores, Uruguay, 12,789
Dominica (isl.), W.I., 59,479
Don (river), England
Don (river), Scotland
Don (river), U.S.S.R.
Don Benito, Spain, 21,852
Doncaster, England, 86,402
Dondra Head (cape), Ceylon
Donegal (bay), Ireland
Donets (river), U.S.S.R.
Donetsk, U.S.S.R., 701,000
Dong Hoi, N. Vietnam
Dongara, Australia, 368
Donggala, Indonesia, 3,821
Dongola, Sudan, 3,800
Doornik (Tournai), Belg., 33,339
Dordogne (river), France
Dordrecht, Netherlands, 77,624
Dore (mountain), France
Dori, Upper Volta, 3,385
Dorking, England, 22,594
Dornbirn, Austria, 28,033
Dornoch (firth), Scotland
Dorohoi, Rumania, 14,771
Dorre (island), Australia
Dorset Heights (hills), England
Dortmund, Germany, 641,480
Dos Bahías (cape), Argentina
Dos Hermanas, Spain, 16,502
Dossor, U.S.S.R., 12,000
Douai, France, 41,649
Douala, Cam., 124,410
Douarnenez, France, 18,519
Douglas,* Isle of Man, 18,837
Douglastown, Quebec, 779
Dour, Belgium, 11,353
Douro (river), Portugal
Dover*, Del., 7,250
Dover, England, 35,248
Dover (strait)
Drăgăşani, Rumania, 9,963
Draguignan, France, 8,879
Drake (passage)
Dráma, Greece, 32,195
Drammen, Norway, 31,312
Drancy, France, 42,096
Drava (river), Yugoslavia
Dresden, Germany, 491,714
Dreux, France, 11,528
Drina (river), Yugoslavia
Drogheda, Ireland, 17,071
Drogobych (Drohobycz), U.S.S.R., 42,000
Drug-Bhilai, India, 133,371
Drumheller, Alta., 2,931
Drummondville, Quebec, 27,909
Dryden, Ontario, 5,728
Dubai,* Tr. Oman, 25,000
Dubawnt (lake), N.W. Terrs.
Dubawnt (river), N.W. Terrs.
Dubbo, Australia, 14,118
Dublin (Baile Atha Cliath), *Ireland, 535,488
Dublin (bay), Ireland
Dubrovka, U.S.S.R., 2,070
Dubrovnik (Ragusa), Yugoslavia, 19,172
Duchess, Australia, 52
Duck Lake, Saskatchewan, 668
Dudinka, U.S.S.R.
Duero (river), Spain
Duisburg, Germany, 502,993
Duluth, Minn., 106,884
Dum Dum, India, 111,507
Dumaguete, Phil. Is., 35,347
Dumbarton, Scotland, 26,335
Dumfries, Scotland, 27,275
Dumyât (Damietta), Egypt, 71,132
Dún Laoghaire (Kingstown), Ireland, 47,803
Dunaújváros, Hung., 27,507
Duncan, British Columbia, 3,726
Duncansby Head (prom.), Scotland
Dundalk, Ireland, 19,706
Dundalk (bay), Ireland
Dundas (strait), Australia
Dundee, Scotland, 182,959
Dundrum (bay), N. Ireland
Dunedin, New Zealand, †105,003
Dunfermline, Scotland, 47,159
Dungarvan, Ireland, 5,188
Dungarvan (harbor), Ireland
Dungeness (prom.), England
Dunkerque (Dunkirk), France, 20,735
Dunnet Headland (prom.), Scotland
Dunstable, England, 25,618
Duparquet, Quebec, 978
Duque de Caxias, Brazil, 173,077
Durango, Mexico, 97,520
Durazno, Uruguay, 19,486
Durban, Natal, †655,370
Durbanville, C. of G. Hope, 3,010
Düren, Germany, 49,138
Durham, England, 20,484
Durham, N.C., 78,302
Durmitor (mountain), Yugoslavia
Durrës (Durazzo), Albania, 25,579
Dushanbe, U.S.S.R., 224,000
Düsseldorf, Germany, 702,596
Düzce, Turkey, 18,169
Dvina, Northern (river), U.S.S.R.
Dvina, Western (river), U.S.S.R.
Dvinsk (Daugavpils), U.S.S.R., 65,000
Dvur Kralové, Czech., 15,040
Dwarka, India, 10,876
Dyment, Ontario, 158
Dzaoudzi,* Comoro Is., 206
Dzaudzhikau (Ordzhonikidze), U.S.S.R., 164,000
Dzerzhinsk, U.S.S.R., 163,000
Dzerzhinsk, U.S.S.R., 12,806
Dzhalal-Abad, U.S.S.R., 14,961
Dzhambeyty, U.S.S.R., 2,388
Dzhambul, U.S.S.R., 67,000
Dzhankoy, U.S.S.R.
Dzhizak, U.S.S.R., 17,500
Dzierżoniów, Poland, 26,200

E

Earn (lake), Scotland
East Anglian Ridge (hills), Eng.
East China (sea)
East London, C. of G. Hope, †114,584
East Retford, England, 17,788
East Saint Louis, Ill., 81,712
East Siberian (sea), U.S.S.R.
Eastbourne, England, 60,897
Eastend, Saskatchewan, 767
Easter (Rapa Nui) (island), Chile, 270

* designates capitals

† designates inclusion of suburbs

Eastern Ghats (mt. range), India
Eastleigh, England, 36,587
Eastmain (river), Quebec
Ebbw Vale, England, 28,631
Ebensee, Austria, 9,590
Eberswalde, Germany, 30,186
Ebingen, Germany, 21,092
Eboli, Italy, 16,315
Ebolowa, Cam., 9,232
Echuca, Australia. 6,443
Écija, Spain, 25,276
Eckernförde, Germany, 19,540
Ed Damer, Sudan, 7,650
Ed Dueim, Sudan, 12,319
Eddystone (point), Australia
Eddystone (rocks), Eng.
Ede, Netherlands, 54,253
Édessa, Greece, 15,534
Edinburgh,* Scotland, 468,378
Edirne, Turkey, 31,865
Edithburgh, Australia, 510
Edjeleh, Algeria
Edmonton,* Alta., †337,568
Edmundston, N.B., 12,791
Edremit, Turkey, 22,246
Edson, Alta., 3,198
Edward (lake), Africa
Eeklo, Belgium, 18,387
Eganville, Ontario, 1,549
Eger, Hungary, 35,375
Eger (Cheb), Czech., 20,590
Eidsvold, Australia, 485
Eigg (island), Scotland, 115
Eil, Somali Rep., †2,067
Eilam, Iran, 6,203
Eileen (lake), N.W. Terrs.
Eilenburg, Germany, 19,980
'Ein Harod, Israel, 1,425
Einbeck, Germany, 18,604
Eindhoven, Netherlands, 157,621
Eirunepé, Brazil, 3,023
Eisenach, Germany, 51,834
Eisenerz, Austria, 12,413
Eisenhüttenstadt, Ger., 22,855
Eisleben, Germany, 29,095
Ekibastuz, U.S.S.R., 10,000
El Agheila, Libya, 1,000
El Aaiúm,* Sp. Sahara, Spain, †5,251
El 'Alamein, Egypt
El Arahal, Spain, 12,133
El Bur, Somali Rep., †2,371
El Callao, Venezuela, 5,079
El Faiyûm, Egypt, 100,816
El Fasher, Sudan, 23,250
El Ferrol del Caudillo, Spain, †74,799
El Goléa, Algeria, 11,527
El Husn, Jordan, 4,510
El Iskandariya (Alexandria), Egypt, 1,497,026
El Jauf, Libya, 2,500
El Karak, Jordan, 7,427
El Khalil (Hebron), Jordan, 37,911
El Kharga, Egypt, 6,686
El Ladhiqiya (Latakia), Syria, 67,799
El Marj, Libya, 8,000
El Minya, Egypt, 92,296

El Obeid, Sudan, 72,300
El Oro, Mexico, 4,283
El Oued, Algeria, 10,494
El Paso, Tex., 276,687
El Progreso, Honduras, 13,779
El Puerto de Santa María, Spain, 28,376
El Qahira (Cairo),* U.A.R., 3,298,885
El Quseir, Egypt, 5,388
El Salto, Mexico, 6,540
El Tigre, Venezuela, 42,028
El Tocuyo, Venezuela, 15,261
Elâzığ, Turkey, 41,915
Elba (island), Italy, 31,641
Elbasan, Albania, 23,615
Elbe (river), Germany
Elbert (mountain), Colo.
Elbeuf, France, 15,341
Elbistan, Turkey, 10,342
Elblag (Elbing), Poland, 74,000
Elbow, Saskatchewan, 401
El'brus (mt.), U.S.S.R.
Elburz (mountains), Iran
Elche, Spain, 31,191
Elda, Spain, 18,785
Elektrostal', U.S.S.R., 97,000
Elephant Butte (res.), N. Mex.
Eleuthera (island), Bahama Is., 6,070
Elgin, Scotland, 11,971
Elgon (mountain), Africa
Elisabethville, R.o.t. Congo, 182,638
Elista, U.S.S.R., 22,000
Elizabeth, Australia, 23,326
Ełk, Poland, 22,500
Elk Island Park, Alta., 69
Elk Lake, Ont., 605
Elkhorn, Manitoba, 666
Elko, British Columbia, 158
Ellesmere Port, England, 44,714
Ellice (islands), Pacific, 4,487
Ellichpur, India, 31,475
Ellore (Eluru), India, 108,367
Elmshorn, Germany, 34,962
Elrose, Saskatchewan, 585
Elsas, Ontario, 150
Elsinore (Helsingör), Denmark, 26,658
Eluru, India, 108,367
Elvas, Portugal, 10,821
Emba (river), U.S.S.R.
Embarcación, Argentina, 3,303
Emden, Germany, 45,713
Emerald, Australia, 2,029
Emerson, Manitoba, 932
Emi Koussi (mtn.), Chad
Emmahaven (Telukbajur), Indon.
Emo, Ontario, 653
Empalme, Mexico, 18,870
Empedrado, Argentina, 3,715
Empoli, Italy, 23,509
Empress, Alta., 405
En Nahud, Sudan, 30,200
Encarnación, Paraguay, 18,783
Ende, Indonesia, 7,226
Endeavour (strait), Australia
Engel's, U.S.S.R., 90,000
Englee, Newfoundland, 802
Englehart, Ontario, 1,786

English (channel)
English Bazar, India, 23,333
Eniwetok (island), Marshall Is.
Enna, Italy, 25,784
Ennis, Ireland, 5,678
Enniscorthy, Ireland, 5,756
Enns, Austria, 8,918
Enschede, Neth., 118,671
Ensenada, Argentina, 35,030
Ensenada, Mexico, 42,770
Enshih, China
Entebbe, Uganda, 10,941
Entwistle, Alberta, 411
Enugu, Nigeria, 62,964
Enzeli (Pahlevi), Iran, 31,349
Epernay, France, 19,527
Épinal, France, 26,288
Er Ramtha, Jordan, 6,410
Erbaa, Turkey, 10,765
Erbil (Arbela), Iraq, 69,280
Erd, Hungary, 23,177
Erechim, Brazil, 24,941
Ereğli, Turkey, 8,815
Ereğli, Turkey, 32,057
Erfurt, Germany, 184,819
Erg Iguidi (desert)
Ericht (lake), Scotland
Erie, Pa., 138,440
Erie (lake), U.S.-Canada
Eriksdale, Manitoba, 190
Erith, England, 45,043
Erivan, U.S.S.R., 509,000
Erlangen, Germany, 69,552
Ermenek, Turkey, 7,536
Ernakulam, India, 46,790
Erne (lake), Ireland
Erode, India, 39,483
Eromanga, Australia, 121
Erris Head (cape), Ireland
Erzgebirge (mt. range)
Erzincan, Turkey, 36,465
Erzurum, Turkey, 91,196
Es Salt, Jordan, 16,213
Esbjerg, Denmark, 55,171
Esch-sur-Alzette, Lux., 27,842
Eschwege, Germany, 24,091
Eschweiler, Germany, 39,590
Escuintla, Guatemala, 9,760
Esk (river), Scotland
Eskilstuna, Sweden, 58,793
Eskimo Point, N.W. Terrs., 98
Eskişehir, Turkey, 153,190
Esmeraldas, Ecuador, †22,500
Esperance, Australia, 1,111
Esperanza, Argentina, 10,035
Espinho, Portugal, 7,989
Esquel, Argentina, 5,584
Essen, Ger., 726,550
Essendon, Australia, 58,987
Essequibo (river), Br. Guiana
Esslingen, Germany, 83,236
Estados, Los (Staten) (island), Argentina
Estância, Brazil, 16,106
Este, Italy, 11,773
Estelí, Nicaragua, 5,557
Estevan, Saskatchewan, 7,728
Eston, England, 37,160
Eston, Saskatchewan, 1,695
Estoril, Portugal, 5,545
Estrêla (mt. range), Portugal

* designates capitals

† designates inclusion of suburbs

Esztergom, Hungary, 23,065
Et Tafila, Jordan, 5,999
Étampes, France, 9,952
Etawah, India, 53,114
Etna (volcano), Sicily, Italy
Eton, Australia, 263
Etosha Pan (dry lake), S.W. Africa
Etterbeek, Belgium, 51,895
Ettlingen, Germany, 19,390
Euboea (island), Greece, 163,215
Eulo, Australia, 60
Eupen, Belgium, 14,338
Euphrates (river)
Euskirchen, Germany, 20,287
Eutin, Germany, 16,924
Evans (mountain), Colo.
Evans (strait), Canada
Evansville, Ind., 141,543
Even Yehuda, Israel, 2,800
Everard (lake), Australia
Everest (mt.), Asia
Évora, Portugal, 25,678
Évreux, France, 20,441
Ewab (Kai) (isls.), Indonesia, 50,648
Ewarton, Jamaica, 2,900
Exe (river), England
Exeter, England, 80,215
Exmoor (forest), England
Exmouth, England, 19,740
Exmouth (gulf), Australia
Eyasi (lake), Tang.
Eyre (lake), Australia
Eyre (peninsula), Australia
Eyüp, Turkey, 73,858
Ez Zarqa', Jordan, 3,000

F

Fabriano, Italy, 20,987
Facatativá, Colombia, 9,779
Fada-N'Gourma, Upper Volta, 4,655
Faenza, Italy, 26,365
Făgăras, Rumania, 17,256
Faguibine (lake), Mali
Fahrej (Iranshahr), Iran, 3,618
Fai Fo (Hoi An), S. Vietnam, 18,000
Fair (island), Scotland, 73
Fairview, Alberta, 1,506
Fairweather (mountain), Alaska-Canada
Faizabad, Afghanistan, 25,000
Faizabad, India, 57,632
Fakfak, West Irian
Falaise, France, 5,289
Falam, Burma
Fălçiu, Rumania, 5,124
Falher, Alberta, 721
Falkensee, Germany, 28,275
Falkirk, Scotland, 38,043
Falkland (islands), 2,239
Fall River, Mass., 99,942
Falmouth, England, 15,427
Falmouth, Jamaica, 4,121
Falso (cape), Mexico
Fălticeni, Rumania, 13,305
Falun, Sweden, 18,818
Famagusta, Cyprus, 34,774
Fanning (island), Pacific, 259
Fano, Italy, 25,428
Farafangana, Malg. Rep., 8,871
Farafra (oasis), Egypt, 749
Farah, Afghanistan, 10,000
Fareham, England, 58,277
Faridpur, Pakistan, 25,287
Farnborough, England, 31,437
Farnham, England, 26,927
Farnham, Quebec, 6,354
Faro, Portugal, 17,631
Farquhar (cape), Australia
Farrukhabad (Fatehgarh), India, 69,418
Fasa, Iran, 11,711
Fasano, Italy, 20,899
Fatehgarh, India, 69,418
Fatehpur, India, 23,253
Fatehpur, India, 27,436
Fatih, Turkey, 299,705
Fátima, Portugal, 4,719
Fatshan, China, 122,500
Favara, Italy, 25,331
Faversham, England, 12,983
Fawn (river), Ontario
Fear (cape), N. Car.
Fécamp, France, 17,193
Feilding, New Zealand, 8,172
Feira de Santana, Brazil, 61,612
Feldkirch, Austria, 17,311
Felixstowe, England, 17,254
Felsögalla, Hungary, 17,110
Feltre, Italy, 13,717
Fenelon Falls, Ontario, 1,137
Fénérive, Malg. Rep., 5,799
Fengkieh, China
Fenyang, China
Feodosiya, U.S.S.R., 28,656
Fergana, U.S.S.R., 80,000
Ferkessédougou, Ivory Coast, 6,500
Ferme-Neuve, Quebec, 1,971
Fermo, Italy, 12,343
Fernando Po (island), 61,197
Fernie, Br. Columbia, 2,808
Ferozepore, India, 82,502
Ferrara, Italy, 92,385
Ferryland, Newfoundland, 656
Feteşti, Rumania, 15,383
Fetlar (island), Scotland, 127
Fez, Morocco, 224,865
Fianarantsoa, Malg. Rep., 36,189
Fife Ness (prom.), Scotland
Figueira da Foz, Portugal, 10,486
Figueras, Spain, †17,548
Figuig, Morocco, 12,108
Fiji (isls.), Pacific, 333,389
Finisterre (cape), Spain
Finland (gulf), Europe
Finlay (river), Br. Columbia
Finschhafen, Terr. N.G., 1,564
Finsterwalde, Germany, 20,766
Firenze (Florence), Italy, 362,459
Firminy, France, 17,941
Firozabad, India, 40,572
Firuzabad, Iran, 4,337
Fisher (strait), Canada
Fitzpatrick, Quebec, 300
Fitzroy (river), Australia
Fiume (Rijeka), Yugoslavia, 100,339
Flamborough Headland (prom.), England
Flanders, Ontario, 188
Flannan (islands), Scotland, 3
Flathead (lake), Mont.
Flattery (cape), Australia
Flattery (cape), Wash.
Fleetwood, England, 27,760
Flensburg, Germany, 98,526
Flers, France, 9,651
Flin Flon, Manitoba, 11,104
Flinders (bay), Australia
Flinders (islands), Tas., Australia
Flinders (mt. range), Australia
Flinders (reef), Australia
Flinders (river), Australia
Flint, Mich., 196,940
Flint, Wales, 14,257
Florence, Italy, 362,459
Florencia, Colombia, 4,164
Flores (island), Indonesia, 944,000
Flores (sea), Indonesia
Floriano, Brazil, 16,063
Florianópolis, Brazil, 74,323
Florida (bay), Fla.
Florida (peninsula), U.S.
Florida (strait), U.S.
Florida, Uruguay, 17,243
Floridia, Italy, 15,519
Flower's Cove, Newf., 278
Flushing, Neth., 29,357
Foam Lake, Saskatchewan, 933
Focşani, Rumania, 28,244
Foggia, Italy, 85,582
Fogo, Newfoundland, 1,152
Fogo (island), Newf., 4,546
Fohnsdorf, Austria, 11,509
Foleyet, Ontario, 550
Foligno, Italy, 33,474
Folkestone, England, 44,129
Fond-du-Lac (river), Sask.
Fontainebleau, France, 17,218
Fontenay-le-Comte, France, 8,139
Fontenay-sous-Bois, France 30,225
Foochow, China, 553,000

Foothills, Alberta, 250
Footscray, Australia, 60,734
Forbes, Australia, 6,826
Forchheim, Germany, 20,947
Forecariah, Guinea, 4,356
Forest (Vorst), Belgium, 50,948
Forestville, Quebec, 1,529
Forlì, Italy, 51,666
Formia, Italy, 15,192
Formosa, Argentina, 16,506
Formosa (Taiwan)(island), China, 11,031,341
Formosa (Taiwan)(strait), China
Forst, Germany, 29,829
Fort-Archambault, Chad, 22,228
Fort-Dauphin, Malg. Rep., 11,190
Fort-de-France,* Martinique, 60,648
Fort de Kock (Bukittinggi), Indonesia, 52,824
Fort-Flatters, Algeria, 362
Fort Frances, Ontario, 9,481
Fort George (river), Quebec
Fort Jameson, N. Rhod., 5,739
Fort-Lamy,* Chad, 58,179
Fort-Laperrine (Tamanrasset), Algeria, 2,710
Fort Macleod, Alta., 2,490
Fort McPherson, N.W.Terrs., 129
Fort Nelson, B.C., 615
Fort Norman, N.W. Terrs., 209
Fort Peck (res.), Mont.
Fort Portal, Uganda, 8,317
Fort Qu'Appelle, Saskatchewan, 1,521
Fort Reliance, N.W. Terr., 698
Fort Resolution, N.W. Terr., 586
Fort Rosebery, N. Rhod., 1,170
Fort Saint James, B.C., 1,081
Fort Saint John, B.C., 3,619
Fort Sandeman, Pakistan, 9,353
Fort Saskatchewan, Alberta, 2,972
Fort Shevchenko, U.S.S.R.
Fort Simpson, N.W. Terr., 563
Fort Smith, N.W. Terr., 1,681
Fort Vermilion, Alberta, 631
Fort Victoria, S. Rhodesia, 3,587
Fort Wayne, Ind., 161,776
Fort William, Ontario, 45,214
Fort Worth, Tex., 356,268
Fortaleza (Ceará), Brazil, 354,942
Forteau, Labrador, Newf., 250
Fortescue (river), Australia
Forth (firth), Scotland
Fougères, France, 18,599
Fourmies, France, 11,805
Fowning, China, 62,144
Fox Valley, Saskatchewan, 479
Foxe (basin), N.W. Terrs.
Foxe (channel), N.W. Terrs.
Foxe (peninsula), N.W. Terrs.
Foyle (bay), N. Ireland
Foz do Iguaçú, Brazil, 7,407
Franca, Brazil, 47,244
Francavilla Fontana, Italy, 24,743
Frankenstein (Ząbkowice Sląskie), Poland, 10,700
Frankenthal, Germany, 33,949
Frankfort,* Ky., 18,365
Frankfurt am Main, Germany, 683,081
Frankfurt an der Oder, Germany, 56,356
Franz, Ontario, 75
Franz Josef Land (isls.), U.S.S.R.
Frascati, Italy, 11,067
Fraser (river), B.C.
Fraser (Great Sandy) (island), Australia
Fraserburgh, Scotland, 10,462
Fraserdale, Ontario, 150
Fray Bentos, Uruguay, 14,625
Frechen, Germany, 26,613
Fredericia, Denmark, 29,870
Fredericton,* New Brunswick, 19,683
Frederikshavn, Denmark, 22,522
Frederiksted, Virg. Isls., 2,177
Fredrikstad, Norway, 13,712
Freetown,* S. Leone, 64,576
Freiberg, Germany, 42,303
Freiburg, Germany, 145,016
Freising, Germany, 27,562
Freital, Germany, 39,159
Fréjus, France, 5,587
Fremantle, Australia, 24,343
Frenchman Butte, Sask., 106
Fresnillo, Mexico, 36,919
Fresno, Calif., 133,929
Freudenstadt, Germany, 14,213
Fribourg, Switzerland, 32,583
Friedberg, Germany, 17,311
Friedrichshafen, Germany, 37,148
Friendly (Tonga) (islands), Pacific, 46,870
Frio (cape), Brazil
Frio (cape), S.W. Africa
Frisian, West (islands), Neth.
Frontera (Alvaro Obregón), Mexico, 8,320
Frozen (strait), Canada
Frunze, U.S.S.R., 217,000
Frutal, Brazil, 8,252
Fryanovo, U.S.S.R.., 2,582
Frýdek-Místek, Czech., 27,890
Fuchu, Japan, 30,308
Fuerte Olimpo, Paraguay, 1,113
Fuji (volcano), Japan
Fujisawa, Japan, 109,101
Fukuchiyama, Japan, 61,490
Fukui, Japan, 149,823
Fukuoka, Japan, 647,122
Fukushima, Japan, 138,961
Fukuyama, Japan, 140,603
Fulda, Germany, 45,131
Funabashi, Japan, 135,038
Funchal,* Madeira, Portugal, 37,035
Fundy (bay), Canada
Fürstenwalde, Germany, 21,782
Fürth, Germany, 97,812
Fusan (Pusan), S. Korea, 1,162,614
Fuse, Japan, 212,754
Fushun, China, 678,600
Fusin, China, 188,600
Fuyü, China, 64,969
Fyne (lake), Scotland
Fyzabad (Faizabad), India, 57,632

G

Gabès, Tunisia, 22,512
Gabès (gulf), Tunisia
Gablonz (Jablonec), Czech., 27,266
Gabrovo, Bulgaria, 21,268
Gadag, India, 56,283
Gadwal, India, 14,716
Găeşti, Rumania, 7,179
Gafsa, Tunisia, 11,320
Gagnoa, Ivory Coast, 9,120
Gaiman, Argentina, 4,000
Gainsborough, England, 17,276
Gairdner (lake), Australia
Galana (river), Kenya
Galashiels, Scotland, 12,374
Galaţi, Rumania, 95,646
Galatina, Italy, 20,975
Galatone, Italy, 12,878
Galilee (sea), Israel
Galkayu, Somali Rep., 8,550
Gallarate, Italy, 27,261
Galle, Ceylon, 49,038
Gallipoli, Italy, 15,416
Gallipoli (Gelibolu), Turkey, 12,956
Gällivare, Sweden, 6,330
Galt, Ontario, 27,830
Galty (mountains), Ireland
Galveston, Tex., 67,175
Galway, Ireland, 21,989
Galway (bay), Ireland
Gamarra, Colombia, 1,963
Gambaga, Ghana, 1,952
Gambela, Ethiopia, 600
Gambier (Mangareva) (islands), Fr. Polynesia, 554
Gamlakarleby (Kokkola), Finland, 16,190
Gananoque, Ontario, 5,096
Ganchi, U.S.S.R., 1,284
Gand (Ghent), Belgium, 159,056
Gander, Newfoundland, 5,725
Gandía, Spain, 15,997
Gandzha (Kirovabad), U.S.S.R.., 116,000
Ganges (river), India

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† designates inclusion of suburbs

Gangtok,* Sikkim
Gannett Peak (mountain), Wyo.
Gao, Mali, 8,000
Gaoua, Upper Volta, 2,631
Gap, France, 13,338
Garanhuns, Brazil, 34,050
Gardelegen, Germany, 12,322
Garden Reach, India, 130,675
Gardez, Afghanistan, 17,540
Gardula, Ethiopia, 4,000
Garmisch-Partenkirchen, Germany, 25,011
Garonne (river), France
Garoua, Cam., 7,000
Garry (lake), N.W. Terrs.
Garulia, India, 20,150
Garut, Indonesia, †67,542
Gary, Ind., 178,320
Gasan-Kuli, U.S.S.R., 3,471
Gascoyne (river), Australia
Gasmata, Terr. N.G.
Gaspé, Quebec, 2,603
Gaspé (peninsula), Quebec
Gatchina, U.S.S.R., 18,589
Gateshead, England, 103,232
Gatooma, S. Rhodesia, 6,122
Gauhati, India, 100,702
Gävle, Sweden, 54,618
Gawler, Australia, 5,639
Gaya, India, 150,884
Gaya, Niger, 3,109
Gaza, Egypt, 34,170
Gaziantep, Turkey, 125,498
Gdańsk (Danzig), Poland, 286,500
Gdynia, Poland, 147,800
Gedaref, Sudan, 30,950
Gedera, Israel, 4,500
Geel, Belgium, 26,281
Geelong, Australia, †91,777
Geelvink (channel), Australia
Geislingen, Germany, 25,844
Gela, Italy, 43,326
Gelibolu, Turkey, 12,956
Gelsenkirchen, Germany, 382,689
Gemlik, Turkey, 12,731
General Acha, Argentina, 4,709
General Alvear, Argentina, 2,548
General Juan Madariaga, Arg., 7,073
General Pico, Argentina, 11,121
Geneva (lake), Switzerland
Geneva (Genève), Switz., 176,183
Genk, Belgium, 47,794
Gennargentu (mountain), Italy
Gennevillers, France, 25,159
Genoa (Genova), Italy, 668,579
Gent (Ghent), Belgium, 159,056
Genthin, Germany, 17,776
Gentilly, France, 16,256
Geographe (bay), Australia
Geographe (channel), Australia
Geok-Tepe, U.S.S.R.
George, C. of G. Hope, 14,505
George (river), Quebec
George Town (Penang), Malaya, 234,930
Georgetown, Australia, 151
Georgetown,* Br. Guiana, 72,991
Georgetown, Gambia, 841
Georgian (bay), Canada
Georgina (river), Australia
Gera, Germany, 98,399
Geraardsbergen (Grammont), Belgium, 9,815
Geraldton, Australia, 10,894
Geraldton, Ontario, 3,375
Germiston, Transv., †204,605
Gerona, Spain, †32,784
Géryville, Algeria, 7,210
Geser, Indonesia
Ghadames, Libya, 2,758
Ghardaia, Algeria, 14,926
Gharian, Libya, †43,747
Ghat, Libya, 732
Ghat Kopar, India, 18,176
Ghazal (river), Chad
Ghazipur, India, 31,326
Ghazni, Afghanistan, 27,084
Ghent, Belgium, 159,056
Gheorgheni, Rumania, 11,969
Gherla, Rumania, 7,617
Gia Dinh, S. Vietnam, 127,200
Gianitsá, Greece, 19,693
Gibeon, S.W. Africa, 485
Gibraltar,* Gibraltar, 24,502
Gibraltar (strait)
Gibson (desert), Australia
Giessen, Germany, 66,291
Gifu, Japan, 304,492
Gigha (passage), Scotland
Gijón, Spain, †124,714
Gila (river), U.S.
Gilbert (isls.), Pacific, 27,824
Gilbert (river), Australia
Gilbert and Ellice (isls.), Pacific, 37,120
Gillam, Manitoba, 95
Gillingham, England, 72,611
Gilly, Belgium, 24,647
Gimli, Manitoba, 1,841
Gingin, Australia, 465
Ginir, Ethiopia, 3,500
Gioia del Colle, Italy, 27,094
Gioiosa Ionica, Italy, 11,675
Giovinazzo, Italy, 13,978
Girdle Ness (prom.), Scotland
Giresun, Turkey, 19,946
Giridih, India, 25,326
Gisborne, New Zealand, †25,065
Giurgiu, Rumania, 32,613
Giv'at Brenner, Israel, 1,586
Givors, France, 12,653
Gizhduvan, U.S.S.R., 4,900
Gizhiga, U.S.S.R.
Giżycko, Poland, 14,600
Gjinokastër, Albania, 12,322
Gjövik, Norway, 7,928
Glace Bay, Nova Scotia, 24,186
Gladstone, Australia, 7,181
Glasgow, Scotland, 1,054,913
Glatz (Kłodzko), Poland, 21,900
Glauchau, Germany, 34,996
Glazov, U.S.S.R., 59,000
Gleichen, Alberta, 426
Glen Innes, Australia, 5,771
Glendale, Calif., 119,442
Glenelg, Australia, 14,492
Glenmorgan, Australia, 143
Glittertind (mountain), Norway
Gliwice (Gleiwitz), Poland, 134,900
Gloggnitz, Austria, 7,225
Glomma (river), Norway
Glossop, England, 17,490
Gloucester, England, 69,687
Głowno, Poland, 11,200
Głuchołazy, Poland, 10,600
Glückstadt, Germany, 12,188
Glukhov, U.S.S.R., 16,000
Gmunden, Austria, 12,473
Gniezno (Gnesen), Poland, 43,100
Gnjilane, Yugoslavia, 9,250
Go Cong, S. Vietnam, 7,570
Goba, Ethiopia, 3,000
Gobabis, S.W. Africa, 4,316
Gobi (Shamo) (desert)
Goch, Germany, 15,195
Godavari (river), India
Godbout, Quebec, 824
Goderich, Ontario, 6,411
Godhavn, Greenland, †584
Godhra, India, 41,986
God's Lake, Manitoba, 200
Godthaab,* Greenland, †3,181
Godwin Austen (mtn.), India
Gogama, Ontario, 500
Gogra (river), India
Goiânia, Brazil, 39,871
Goiás, Brazil, 5,606
Gölcük, Turkey, 19,114
Golden (valley), Ireland
Golitsyno, U.S.S.R., 1,500
Gomel', U.S.S.R., 166,000
Gómez Palacio, Mexico, 60,760
Gona, Papua
Gonaïves, Haiti, 15,373
Gonda, India, 21,567
Gondar, Ethiopia, 14,000
Gönen, Turkey, 10,848
Good Hope (cape), S. Afr.
Goole, England, 18,875
Goomalling, Australia, 619
Goondiwindi, Australia, 3,274
Goose (lake), U.S.
Goose Airport (Goose Bay), Lab., Newfoundland, 4,007
Göppingen, Germany, 48,937
Gorakhpur, India, 179,774
Gore, Ethiopia, 25,000
Gore, New Zealand, 7,270
Gore Bay, Ontario, 716
Gori, U.S.S.R., 15,000
Gorinchem (Gorkum), Neth., 21,219
Gorizia, Italy, 38,497
Gor'kiy, U.S.S.R.., 942,000
Gorlice, Poland, 10,500
Görlitz, Germany, 92,351
Gorlovka, U.S.S.R., 293,000
Gorna Dzhumaya (Blagoyevgrad), Bulgaria, 14,066
Gorna Oryakhovitsa, Bulgaria, 10,303
Gorno-Altaysk, U.S.S.R., 27,000
Goroka, Terr. N.G., 1,973

* designates capitals

† designates inclusion of suburbs

Gorontalo, Indonesia, 15,603
Gorzów Wielkopolski (Landsberg), Poland, 50,700
Goslar, Germany, 41,374
Gospić, Yugoslavia, 5,127
Gosport, England, 62,436
Göteborg (Gothenburg), Sweden, 404,349
Gotha, Germany, 57,639
Gotland (island), Sweden, 53,480
Goto (islands), Japan, 302,244
Gotse Delchev, Bulgaria, 11,061
Göttingen, Germany, 80,919
Gottwaldov (Zlín), Czech., 54,189
Gouda, Netherlands, 43,234
Gouin (res.), Quebec
Goulburn, Australia, 20,544
Goulburn (islands), Australia
Goundam, Mali, 6,500
Governador Valadares, Brazil, 20,864
Goya, Argentina, 20,804
Goyders (lagoon), Australia
Graaff-Reinet, C. of G. Hope, 16,703
Gračanica, Yugoslavia, 5,620
Gracefield, Quebec, 670
Gracias a Dios (cape), Nicaragua
Grafton, Australia, 15,526
Graham, Ontario, 49
Grahamstown, C. of G. Hope, 32,195
Grammont, Belgium, 9,815
Grampians (mountains), Scotland
Gran Chaco (region), S.A.
Granada, Nicaragua, 21,035
Granada, Spain, †157,178
Granby, Quebec, 31,463
Grand (canal), China
Grand Bahama (island), Bahama Is., 4,095
Grand Bank, Newfoundland, 2,703
Grand-Bassam, Ivory C., 12,000
Grand Cayman (island), Cayman Is., 6,345
Grand Coulee (dam), Wash.
Grand Falls, New Brunswick, 3,983
Grand Falls, Newfoundland, 6,605
Grand Forks, Br. Columbia, 2,347
Grand-Lahou, Ivory C., 2,200
Grand Rapids, Manitoba, 274
Grand Rapids, Mich., 177,313
Grande (bay), Arg.
Grande (river), Brazil
Grande Prairie, Alberta, 8,352
Grande-Rivière, Quebec, 1,176
Grande-Vallée, Quebec, 459
Grandes-Bergeronnes, Quebec, 779
Grangemouth, Scotland, 18,860
Granollérs, Spain, 12,662
Grantham, England, 25,030
Granville, Australia, 26,949
Granville, France, 9,858
Granville, Yukon, 108
Grasse, France, 13,731
Graudenz (Grudziądz), Poland, 64,100
Gravelbourg, Saskatchewan, 1,499
Gravenhurst, Ontario, 3,077
Gravesend, England, 51,388
Gravina di Puglia, Italy, 29,895
Graz, Austria, 237,041
Great Abaco (island), Bahama Is., 3,407
Great Australian (bay), Australia
Great Barrier (reef), Australia
Great Bear (lake), N.W. Terrs.
Great Dividing (mt. range), Australia
Great Exuma (island), Bahama Is. 2,919
Great Inagua (island), Bahama Is., 999
Great Khingan (mt. range), China
Great Salt (lake), Utah
Great Sandy (desert), Australia
Great Sandy (Fraser)(island), Australia
Great Slave (lake), N.W. Terrs.
Great Victoria (desert), Australia
Great Wall, China
Great Whale (river), Quebec
Great Yarmouth, England, 52,860
Greater Antilles (islands)
Green (river), U.S.
Green Bay, Wis., 62,888
Greenland (island), 33,113
Greenock, Scotland, 74,578
Greensboro, N.C., 119,574
Greenville, S.C., 66,188
Greenwich, England, 85,585
Gregory (mt. range), Australia
Greifswald, Germany, 43,590
Greiz, Germany, 45,410
Grenada (island), W.I., 88,617
Grenchen, Switzerland, 18,000
Grenfell, Saskatchewan, 1,256
Grenoble, France, 111,054
Grenville (cape), Australia
Gresik, Indonesia, 36,790
Gretna, Manitoba, 575
Greymouth, N.Z., 8,881
Griffith, Australia, 7,696
Grimma, Germany, 14,310
Grimsby, England, 96,665
Grimshaw, Alberta, 1,095
Grindelwald, Switzerland, 3,244
Griquatown, C. of G. Hope, 2,524
Grodekovo, U.S.S.R., 4,066
Grodno, U.S.S.R., 72,000
Grodzisk Mazowiecki, Poland, 18,900
Gronau, Germany, 25,560
Groningen, Neth., 142,889
Groote Eylandt (island), Australia
Grootfontein, S.W. Africa, 3,722
Grossenhain, Germany, 17,708
Grossglockner (mtn.), Austria
Grosseto, Italy, 29,364
Grottaglie, Italy, 18,819
Grouard Mission, Alberta, 328
Groznyy, U.S.S.R., 240,000
Grudziądz (Graudenz), Poland, 64,100
Grünberg (Zielona Góra), Poland, 48,000
Gryfice, Poland, 11,000
Guadalajara, Mexico, 734,346
Guadalajara, Spain, †21,230
Guadalcanal (island), Solomon Is. Prot., 14,500
Guadalquivir (river), Spain
Guadarrama (mt. range), Spain
Guadeloupe (island), 270,000
Guadiana (river), Spain
Guadix, Spain, 17,465
Guajará-Mirim, Brazil, 7,115
Guajira (peninsula), Colombia
Guam (island), Pacific, 59,498
Guanabacoa, Cuba, 32,490
Guanajay, Cuba, 12,908
Guanajuato, Mexico, 28,135
Guanare, Venezuela, †18,476
Guánica, Puerto Rico, 4,100
Guantánamo, Cuba, 64,671
Guapi, Colombia, 1,348
Guaporé (river), S.A.
Guaranda, Ecuador, 7,287
Guarapuava, Brazil, 13,546
Guarda, Portugal, 7,704
Guardafui (cape), Somali Rep.
Guatemala,* Guat., 300,500
Guaviare (river), Colombia
Guayama, Puerto Rico, 19,183
Guayaquil, Ecuador, †500,287
Guayaquil (gulf), Ecuador
Guaymas, Mexico, 34,845
Guben, Germany, 25,297
Gudur, India, 12,105
Guebwiller, France, 9,695
Guelph, Ontario, 39,838
Guéret, France, 8,239
Guildford, England, 53,977
Guimarães, Portugal, 18,294
Güines, Cuba, 29,226
Gujranwala, Pakistan, 197,000
Gujrat, Pakistan, 46,971
Gull Lake, Saskatchewan, 1,038
Gulpaigan, Iran, 12,400
Gumeracha, Australia, 467
Gummersbach, Germany, 32,009
Gümüşhaciköy, Turkey, 9,426
Guna, India, 15,328
Gunnedah, Australia, 6,543
Guntakal, India, 20,414
Guntur, India, 187,068
Gunungsitoli, Indonesia, †44,712
Gurgan (river), Iran
Gurgan (Asterabad), Iran, 28,380
Gurgueia (river), Brazil
Gurupá, Brazil, 912
Gurupi (river), Brazil
Gur'yev, U.S.S.R.., 78,000
Gusau, Nigeria, 40,202
Gusinje, Yugoslavia, 2,555
Güstrow, Germany, 32,899
Gütersloh, Germany, 52,346
Guysborough, Nova Scotia, 430
Gwa, Burma
Gwabegar, Australia, 378
Gwalior and Lashkar, India, 300,513

* designates capitals

† designates inclusion of suburbs

Gwanda, S. Rhodesia, 1,034
Gwelo, S. Rhodesia, 12,356
Gyangtse, China
Gydan (Kolyma) (mt. range), U.S.S.R.
Gympie, Australia, 11,094
Gyöngyös, Hungary, 28,668
Győr, Hungary, 70,812
Gypsumville, Manitoba, 224
Gýtheion, Greece, 4,992
Gyula, Hungary, 24,609

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Ha Giang, N. Vietnam
Ha Tien, S. Vietnam, 5,200
Ha Tinh, N. Vietnam
Haad Yai, Thailand, 19,426
Haarlem, Netherlands, 167,264
Habiganj, Pakistan, 19,378
Hachinohe, Japan, 174,348
Hachioji, Japan, 158,443
Hadar Ramatayim, Israel, 6,572
Hadd (cape), Oman
Hadera, Israel, 25,358
Haderslev, Denmark, 19,735
Hadhramaut (region), Aden Prot.
Haeju, N. Korea, 82,135
Hafun (Dante), Somali Rep., 2,000
Hafun (cape), Somali Rep.
Hagen, Germany, 195,527
Hagi, Japan, 56,831
Hague, The ('s Gravenhage), *Netherlands, 606,728
Haguenau, France, 15,103
Haifa, Israel, 182,007
Hail, Saudi Arabia, 15,000
Hailar (Hulun), China, 43,200
Haileybury, Ontario, 2,638
Hailun, China, 344,700
Hailuoto (island), Finland, 1,369
Hainan (island), China
Hainburg, Austria, 6,440
Haiphong, N. Vietnam, 143,000
Hajduboszörmény, Hungary, 32,214
Hajdunánás, Hungary, 18,413
Hajduszoboszló, Hungary, 19,661
Hajnówka, Poland, 11,800
Hakata, Japan, 392,649
Hakodate, Japan, 243,012
Halberstadt, Germany, 45,410
Halden, Norway, 9,967
Haldensleben, Germany, 22,016
Haleb (Aleppo), Syria, 425,029
Haliburton, Ontario, 983
Halifax, England, 96,075
Halifax,* Nova Scotia, 92,511
Halifax, Greater, N.S., 183,946
Hall, Germany, 19,266
Hall (Solbad Hall), Austria, 10,680
Halle (Hal), Belgium, 18,947
Halle, Germany, 280,614
Hallein, Austria, 13,326
Hall's Creek, Australia, 161
Halmahera (isl.), Indonesia, 97,133
Halmstad, Sweden, 39,064
Hälsingborg, Sweden, 76,504
Hama, Syria, 110,809
Hamada, Japan, 46,626
Hamadan, Iran, 99,909
Hamamatsu, Japan, 333,009
Hamar, Norway, 13,493
Hamburg, Germany, 1,832,374
Hämeenlinna (Tavastehus), Finland, 28,321
Hameln, Germany, 50,436
Hamhŭng, N. Korea, 112,184
Hami, China
Hamilton, Australia, 9,495
Hamilton,* Bermuda, 2,763
Hamilton (inlet), Newf.
Hamilton, New Zealand, †50,505
Hamilton, Ohio, 72,354
Hamilton, Ontario, 273,991
Hamilton, Greater, Ontario, 395,189
Hamilton, Scotland, 41,928
Hamm, Germany, 70,641
Hammerfest, Norway, 5,862
Hammersley (mt. range), Australia
Hanamaki, Japan, 62,385
Hanamkonda, India, 156,163
Hanau, Germany, 47,207
Hangchow, China, 696,600
Hangö (Hanko), Finland, 8,157
Hankow (incl. in Wuhan), China, 750,000
Hanna, Alberta, 2,645
Hanno, Japan, 44,153
Hannover (Hanover), Germany, 573,124
Hannoversch-Münden, Germany, 20,230
Hanoi,* N. Vietnam, 237,150
Hanover (island), Chile
Hanover, Ontario, 4,401
Hansard, Br. Columbia, 92
Hanyang (incl. in Wuhan), China, 101,357
Harar, Ethiopia, 45,000
Harbin, China, 1,163,000
Harbour Deep, Newf., 214
Harbour Grace, Newf., 2,650
Harburg-Wilhelmsburg, Germany
Harda, India, 15,120
Hardanger (fjord), Norway
Hardisty, Alberta, 582
Hardoi, India, 24,252
Hardwar, India, 40,823
Hargeisa, Somali Rep., 20,000
Hariq, Saudi Arabia, 5,000
Hârlău, Rumania, 4,172
Harney (lake), Oreg.
Harney Peak (mountain), S. Dak.
Härnösand, Sweden, 17,178
Harrington Harbour, Quebec, 163
Harris (lake), Australia
Harris (district), Scotland
Harris (sound), Scotland
Harrisburg,* Pa., 79,697
Harrogate, England, 56,332
Hârşova, Rumania, 4,761
Hartford,* Conn., 162,178
Hartland (point), England
Hartland, New Brunswick, 1,025
Hartlepool, England, 17,674
Hartley, S. Rhodesia, 999
Hartney, Manitoba, 592
Harwich, England, 13,569
Hassan, India, 14,596
Hasselt, Belgium, 36,062
Hassi-Messaoud, Algeria, 54
Hassloch, Germany, 15,350
Hastings, England, 66,346
Hastings, New Zealand, †32,490
Hatay (Antâkya), Turkey, 45,848
Hateg, Rumania, 3,853
Hathras, India, 46,994
Hatteras (cape), N.C.
Hatvan, Hungary, 19,952
Haugesund, Norway, 27,123
Hauta, Saudi Arabia, 12,000
Hautmont, France, 14,127
Havana (La Habana),* Cuba, 785,455
Havant and Waterloo, England, 74,504
Havasu (lake), U.S.
Havlíčkuv Brod, Czech., 14,944
Havre (Le Havre), France, 137,175
Havre-Saint-Pierre, Quebec, 1,000
Hawaii (island), U.S., 68,350
Hawera, New Zealand, 7,542
Hawick, Scotland, 16,204
Hawkesbury, Ontario, 8,661
Hawston, C. of G. Hope, 1,209
Hay, Australia, 3,134
Hay (river), Australia
Hay (river), Canada
Hay River, N.W. Terrs., 1,338
Hayange, France, 10,266
Hazaribagh, India, 24,918
Hazebrouck, France, 11,896
Hazelton, Br. Columbia, 410
Heanor, England, 23,867
Hearst, Ontario, 2,373
Hebrides (islands), Scotland, 32,577
Hebron (El Khalil), Jordan, 37,911
Hecate (strait), Br. Columbia
Heemstede, Netherlands, 25,896
Heerlen, Netherlands, 67,162
Heide, Germany, 19,983
Heidelberg, Australia, 86,430
Heidelberg, Germany, 125,264
Heidenau, Germany, 18,694

* designates capitals

† designates inclusion of suburbs

Heidenheim, Germany, 48,790
Heijo (P'yŏngyang),* N. Korea, 653,100
Heilbronn, Germany, 89,100
Heinsburg, Alberta, 135
Hekla (mountain), Iceland
Helena,* Mont., 20,227
Helensburgh, Australia, 2,000
Helgoland (island), Germany
Hell-Ville, Malg. Rep., 8,572
Hellín, Spain, 13,257
Helmand (river), Afghanistan
Helmond, Netherlands, 42,673
Helmstedt, Germany, 29,560
Helsingör, Denmark, 26,658
Helsinki (Helsingfors),* Finland, 452,800
Hemel Hempstead, England, 55,164
Hendek, Turkey, 9,871
Hengelo, Neth., 56,765
Hengyang, China, 235,000
Hénin-Liétard, France, 22,347
Henley and Grange, Australia, 11,680
Henrietta Maria (cape), Ontario
Henzada, Burma, 60,666
Hērákleion (Candia), Greece, 63,458
Herat, Afghanistan, 61,760
Herbert, Saskatchewan, 1,008
Hercegnovi, Yugoslavia, 1,873
Heredia, Costa Rica, 18,749
Hereford, England, 40,431
Herentals, Belgium, 17,529
Herford, Germany, 55,663
Herisau, Switzerland, 14,361
Hermanus, C. of G. Hope, 4,586
Hermil, Lebanon, 4,796
Hermosillo, Mexico, 96,122
Herne, Germany, 113,207
Herne Bay, England, 21,273
Herning, Denmark, 24,790
Heron Bay, Ontario, 175
Herstal, Belgium, 29,645
Hervey (bay), Australia
Herzliya, Israel, 26,809
Hetton-le-Hole, England, 17,463
High Prairie, Alberta, 1,756
High River, Alberta, 2,276
High Wycombe, England, 50,301
Hikone, Japan, 51,613
Hilda, Alebrta, 285
Hildesheim, Germany, 96,341
Hilla, Iraq, 80,017
Hilleröd, Denmark, 11,605
Hillston, Australia, 1,019
Hilversum, Netherlands, 97,312
Himalaya (mt. range)
Himeji, Japan, 328,689
Himi, Japan, 65,962
Hinche, Haiti, 5,847
Hinchinbrook (island), Australia
Hinckley, England, 41,573
Hindenburg (Zabrze), Poland, 188,800
Hindmarsh, Australia, 12,914
Hindu Kush (mt. range)
Hindupur, India, 19,049
Hines Creek, Alberta, 398
Hinganghat, India, 28,040
Hingoli, India, 14,601
Hinojosa del Duque, Spain, 13,684
Hirakata, Japan, 80,312
Hiratsuka, Japan, 108,279
Hirosaki, Japan, 12,592
Hiroshima, Japan, 431,336
Hirschberg (Jelenia Góra), Poland, 47,900
Hirson, France, 10,208
Hispaniola (island), 6,552,525
Hissar, India, 28,618
Hit, Iraq, 8,000
Hitachi, Japan, 161,226
Hitchin, England, 24,243
Hitoyoshi, Japan, 47,259
Hjörring, Denmark, 15,038
Ho, Ghana, 15,000
Hoa Binh, N. Vietnam
Hobart, Australia, †115,932
Hoboken, Belgium, 30,502
Hodeida, Yemen, 40,000
Hodh (reg.), Mauritania, 169,000
Hódmezővásárhely, Hungary, 53,505
Hodonín, Czech., 18,044
Hodur, Somali Rep., 2,500
Hof, Germany, 57,129
Hofei, China, 183,600
Hofu, Japan, 94,513
Hofuf, Saudi Arabia, 100,000
Hohenems, Austria, 9,175
Hohensalza (Inowrocław), Poland, 47,000
Hoi An, S. Vietnam, 18,000
Hoihow, China, 135,300
Hokitika, New Zealand, 3,007
Hokkaido (island), Japan, 5,039,206
Holbaek, Denmark, 15,475
Holbrook, Australia, 1,158
Holguín, Cuba, 57,573
Hollandia (Kotabaru),* West Iriar 15,153
Holmes (reefs), Australia
Holon, Israel, 48,102
Holstebro, Denmark, 18,563
Holy (island), England, 388
Holyhead, Wales, 10,408
Holzminden, Germany, 22,466
Homalin, Burma
Hombori, Mali, 3,263
Home Hill, Australia, 3,217
Homs, Libya, †12,918
Homs, Syria, 136,474
Hon, Libya, †3,681
Honduras (gulf)
Hongsŏng, S. Korea, 20,395
Hongwŏn, N. Korea, 25,663
Honiara, *Sol. Is. Prot., 2,000
Honolulu,* Hawaii, 294,194
Honshu (island), Japan, 71,354,284
Hood (mountain), Oreg.
Hooghly and Chinsura, India, 49,081
Hoorn (islands), Wallis and Futuna, 2,005
Hope, Br. Columbia, 2,751
Hopedale, Lab., Newf., 167
Hopetoun, Australia, 65
Hopfgarten, Austria, 4,166
Hoppo, China, 80,000
Horn (Hornos) (cape), Chile
Hornchurch, England, 128,127
Hornepayne, Ontario, 1,562
Horqueta, Paraguay, 4,573
Horsens, Denmark, 37,261
Horsham, Australia, 9,240
Horsham, England, 21,155
Horten, Norway, 13,450
Hoshangabad, India, 13,290
Hospet, India, 26,023
Hospitalet, Spain, 66,637
Hoste (island), Chile
Hotien (Khotan), China
Houston, Tex., 938,219
Houtman Abrolhos, (Abrolhos Is.) Australia
Hove, England, 72,843
Howe (cape), Australia
Howland (island), Pacific, 4
Howley, Newfoundland, 452
Howrah, India, 514,090
Hoy (island), Scotland, 685
Hoylake, England, 32,268
Hradec Králové, Czech., 55,147
Hranice, Czech., 10,765
Hrubieszów, Poland, 12,000
Hsinking (Changchun), China, 855,200
Hsipaw, Burma
Huacas (point), Peru
Huacho, Peru, 22,182
Huamantla, Mexico, 9,811
Huancavelica, Peru, 11,038
Huancayo, Peru, 46,014
Huanchaca, Bolivia
Huanuco, Peru, 24,606
Huarás, Peru, 20,532
Huascarán (mountain), Peru
Huasco, Chile, 1,537
Hubli, India, 170,163
Hucknall, England, 25,246
Huddersfield, England, 130,302
Hudson, Ontario, 655
Hudson (bay), Canada
Hudson (strait), Canada
Hudson Bay, Saskatchewan, 1,601
Hue, S. Vietnam, 90,682
Huedin, Rumania, 5,134
Huelva, Spain, †74,384
Huesca, Spain, †24,377
Hughenden, Australia, 2,329
Huhehot, China, 148,400
Huixtla, Mexico, 12,344
Hull (Kingston-upon-Hull), England, 303,268
Hull, Quebec, 56,929
Hulun (Hailar), China, 43,200
Humacao, Puerto Rico, 8,005
Humaitá, Brazil, 1,192
Humber (estuary), England
Humboldt, Saskatchewan, 3,245

* designates capitals

† designates inclusion of suburbs

Humboldt (river), Nev.
Humphreys Peak (mountain), Ariz.
Húnaflói (fjord), Iceland
Hunchun, China, 13,246
Hunedoara, Rumania, 36,498
Hŭngnam, N. Korea, 143,600
Huntington, W. Va., 83,627
Huntly, New Zealand, 4,633
Huntsville, Ala., 72,365
Huntsville, Ontario, 3,189
Huon (gulf), Terr. N.G.
Huong Khê, N. Vietnam
Huron (lake), U.S.-Canada
Hurstbridge, Australia, 824
Hurstville, Australia, 61,005
Huşi, Rumania, 18,055
Husum, Germany, 23,806
Huy (Hoei), Belgium, 13,448
Hwainan, China, 286,900
Hwang Ho (river), China
Hwangju, N. Korea, 16,993
Hwangshih, China, 110,500
Hyden, Australia, 302
Hyderabad, India, 1,252,337
Hyderabad, Pakistan, 434,000
Hyères, France, 15,649
Hythe, Alberta, 449
Hyvinkää (Hyvinge), Finland, 20,335

I

Iaco (river), Brazil
Iar Connaught (region), Ireland
Iaşi, Rumania, 112,977
Iba, Philippine Islands, 14,565
Ibadan, Nigeria, 459,196
Ibagué, Colombia, †133,380
Ibar (river), Yugo.
Ibaraki, Japan, 51,014
Ibarra, Ecuador, †24,580
Ibbenbüren, Germany, 15,676
Ibo, Moz., 4,366
Ica, Peru, 38,347
Içá (river), Brazil
Içel (Mersin), Turkey, 68,574
Ichang, China, 75,000
Ichchapuram, India, 11,159
Ichikawa, Japan, 157,301
Ichinomiya, Japan, 157,025
Idar-Oberstein, Germany, 30,182
Idfu, Egypt, 25,009
Idi, Indonesia
Ieper (Ypres), Belgium, 18,134
Iesi, Italy, 21,598
Igarka, U.S.S.R., 20,000
Iğdir, Turkey, 12,658
Iglau (Jihlava), Czech., 34,744
Iglesias, Italy, 20,816
Ignace, Ontario, 300
Iguacú (river), Brazil
Iguala, Mexico, 28,814
Igualada, Spain, 15,684
Iguassú (falls), S.A.
Iguatu, Brazil, 16,540
Ihosy, Malg. Rep., 3,488
Iida, Japan, 67,555
IJmuiden, Netherlands, 22,121
IJsselmeer (lake), Netherlands
Ijuí (river), Brazil
Ikeda, Japan, 16,731
Ikryanoye, U.S.S.R., 2,296
Ilagan, Philippine Islands, 48,677
Ile à la Crosse, Sask., 25
Ilford, Manitoba, 97
Ilhéus, Brazil, 45,712
Ili (river)
Ilkeston, England, 34,672
Ilkley, England, 18,519
Illapel, Chile, 10,395
Il'men (lake), U.S.S.R.
Ilmenau, Germany, 18,603
Ilo, Peru, 10,172
Iloilo, Philippine Is., 150,976
Ilorin, Nigeria, 54,700
Il'yaly, U.S.S.R., 1,500
Imabari, Japan, 100,082
Iman, U.S.S.R.
Imandra (lake), U.S.S.R.
Imari, Japan, 81,625
Imatra, Finland, 33,449
Imi, Ethiopia, 300
Imola, Italy, 26,982
Imperia, Italy, 28,295
Imphal, India, 99,716
Inari (lake), Finland
Inawashiro (lake), Japan
Inca, Bal. Is., Spain, 12,852
Inch'ŏn, S. Korea, 402,009
Indian (peninsula)
Indian (Thar) (des.), India
Indian Head, Sask., 1,802
Indianapolis,* Ind., 476,258
Indigirka (river), U.S.S.R.
Indochina (peninsula)
Indore, India, 395,035
Indramaju, Indonesia, †56,117
Indus (river)
Inegöl, Turkey, 25,227
Ingersoll, Ontario, 6,874
Ingham, Australia, 4,790
Ingolstadt, Germany, 53,405
Ingonish, N.S., 373
Inhambane, Moz., 5,134
Inini (region), Fr. Guiana, 3,234
Inishbofin (island), Ireland
Inishturk (island), Ireland
Injune, Australia, 504
Inn (river)
Innisfail, Alberta, 2,270
Innisfail, Australia, 6,917
Innsbruck, Austria, 100,699
Inny (river), Ireland
Inowrocław, Poland, 47,000
Insein, Burma, 20,487
Interlaken, Switzerland, 4,738
Inubo (cape), Japan
Inuvik, N.W. Terrs., 1,248
Invercargill, N.Z., †41,088
Inverell, Australia, 8,209
Inverie, Scotland
Inverness, N.S., 2,109
Inverness, Scotland, 29,773
Investigator (strait), Aust.
Investigator's (islands), Aust.
Ioánnina, Greece, 34,997
Iolotan', U.S.S.R., 3,160
Ioma, Papua
Iona (island), Scotland, 173
Ionian (sea)
Ipiales, Colombia, 8,343
Ipin, China, 177,500
Ipoh, Malaya, 125,776
Ipswich, Australia, 48,679
Ipswich, England, 117,325
Ipu, Brazil, 7,724
Iquique, Chile, 50,655
Iquitos, Peru, 55,696
Iracoubo, French Guiana, 1,109
Iran (mountains)
Iranshahr (Fahrej), Iran, 3,618
Irapuato, Mexico, 83,805
Irbid, Jordan, 44,805
Irbit, U.S.S.R., 23,500
Iri, S. Korea, 65,726
Iriri (river), Brazil
Irish (sea)
Irkutsk, U.S.S.R., 365,000
Iron Knob, Australia, 650
Iroquois Falls, Ontario, 1,681
'Irqa, S. Arabia
Irrawaddy (river), Burma
Irtysh (river), U.S.S.R.
Irvine, Scotland, 16,910
Isaacs (river), Australia
Isabela (bay), Dom. Rep.
Isaccea, Rumania, 4,653
Isahaya, Japan, 64,506
Ise, Japan, 99,026
Iserlohn, Germany, 55,257
Isfahan, Iran, 254,708
Isha Baidoa, Somali Rep., 15,725
Ishim, U.S.S.R., 34,500
Ishim (river), U.S.S.R.
Ishimbay, U.S.S.R.
Ishinomaki, Japan, 83,947
Iskenderun, Turkey, 63,736
Iski-Naukat, U.S.S.R., 5,000
Iskilip, Turkey, 12,285
Island (lake), Manitoba
Islay (island), Scotland, 3,866
Ismailia, Egypt, 274,484
Isparta, Turkey, 36,201
Issoudun, France, 11,794
Issy-les-Moulineaux, Fr., 39,818
Issyk-Kul' (lake), U.S.S.R.
Istanbul, Turkey, 1,459,528
Istonio (Vasto), Italy, 14,036
Itabuna, Brazil, 54,268

* designates capitals

† designates inclusion of suburbs

Itacoaí (river), Brazil
Itacoatiara, Brazil, 8,818
Itaituba, Brazil, 1,187
Itajaí, Brazil, 19,797
Itajubá, Brazil, 31,262
Itala (El Athale), Somali Rep., †844
Itami, Japan, 86,455
Itapecuru (river), Brazil
Itapicuru (river), Brazil
Itapipoca, Brazil, 7,186
Itaqui, Brazil, 13,223
Itarsi, India, 14,269
Ithaca (island), Greece, 5,210
Iturup (island), U.S.S.R.
Ituxí (river), Brazil
Itzehoe, Germany, 36,081
Ivanhoe, Australia, 546
Ivanovka, U.S.S.R., 4,590
Ivanovo, U.S.S.R., 332,000
Ivry-sur-Seine, France, 40,377
Iwakuni, Japan, 100,346
Iwamisawa, Japan, 55,774
Iwo (island), Bonin Is.
Ixelles, Belgium, 94,046
Ixtapalapa, Mexico, 25,517
Ixtepec, Mexico, 12,083
Izhevsk, U.S.S.R., 283,000
Izmail (Ismail), U.S.S.R., 17,569
Izmir (Smyrna), Turkey, 370,923
Izmit, Turkey, 73,705
Izu (islands), Japan, 20,382
Izúcar de Matamoros, Mexico, 16,175
Izumiotsu, Japan, 42,304
Izumisano, Japan, 56,827

J

Jabalpur (Jubbulpore), India, 367,215
Jablonec nad Nisou, Czech., 27,266
Jacarèzinho, Brazil, 14,813
Jackson,* Miss., 144,422
Jacksonville, Fla., 201,030
Jacmel, Haiti, 9,397
Jacobabad, Pakistan, 22,827
Jacobina, Brazil, 12,373
Jadotville, R.o.t. Congo, 74,478
Jaén, Spain, †64,917
Jaffa-Tel Aviv, Israel, 386,612
Jaffna, Ceylon, 76,664
Jagdalpur, India, 11,304
Jagtial, India, 16,294
Jaguarão, Brazil, 12,336
Jaguaribe (river), Brazil
Jahrum, Iran, 29,169
Jaicós, Brazil, 1,308
Jaipur, India, 402,760
Jajce, Yugoslavia, 5,557
Jajpur, India, 11,188
Jakarta (Djakarta),* Indonesia, 1,992,999
Jakobstad (Pietarsaari), Finland, 14,718
Jalalabad, Afghan., 44,290
Jalapa, Guatemala, 6,610
Jalapa, Mexico, 66,317
Jalgaon, India, 48,596
Jalna, India, 48,423
Jalpaiguri, India, 27,766
Jaluit (island), Marshall Is., 1,093
Jamaica (island), 1,613,880
Jamalpur, India, 39,401
Jamalpur, Pakistan, 26,952
Jamanchim (river), Brazil
James (bay), Canada
James (river), U.S.
James (river), U.S.
Jamestown, Australia, 1,304
Jammu, India, 108,562
Jamnagar, India, 147,420
Jamshedpur, India, 332,134
Jan Mayen (island), Norway
Jandowae, Australia, 1,028
Jánoshalma, Hungary, 13,189
Januária, Brazil, 9,741
Jaora, India, 25,501
Japan (sea)
Japurá (river), Brazil
Jarabub (Jaghbub), Libya, 215
Jarash, Jordan, 3,743
Jarí (river), Brazil
Jarocin, Poland, 15,500
Jaroměr, Czech., 11,853
Jarosław, Poland, 26,200
Jarrow, England, 28,752
Jarvis (island), Pacific, 3
Jask, Iran, 1,078
Jasper, Alberta, 2,360
Jasper (park), Alberta, 2,902
Jassy (Iaşi), Rumania, 112,977
Jászárokszállás, Hung., 11,124
Jaszberény, Hungary, 30,218
Játiva, Spain, 17,164
Jaú, Brazil, 31,229
Jauf, Saudi Arabia, 7,500
Jauja, Peru, 12,673
Jaunpur, India, 44,833
Java (island), Indonesia, 54,475,636
Java (sea)
Javarí (Yavarí) (river), S.A.
Jawor (Jauer), Poland, 12,900
Jaworzno, Poland, 49,500
Jedrzejów, Poland, 11,900
Jefferson City,* Mo., 28,288
Jelenia Góra, Poland, 47,900
Jelgava, U.S.S.R., 34,099
Jemappes, Belg., 12,893
Jena, Germany, 82,722
Jenin, Jordan, 13,854
Jequié, Brazil, 40,158
Jérémie, Haiti, 12,456
Jerez de la Frontera, Spain, †130,900
Jerez de los Caballeros, Spain, 12,738
Jericho (Ariha), Jordan, 10,284
Jerusalem (New City),* Israel, 166,301
Jerusalem (Old City), Jordan, 60,337
Jesenice, Yugoslavia, 13,202
Jesselton,* No. Borneo, 21,719
Jessore, Pakistan, 23,867
Jette, Belgium, 33,918
Jever, Germany, 10,720
Jeypore, India, 12,504
Jhang-Maghiana, Pak., 73,397
Jhansi, India, 170,209
Jhelum, Pakistan, 38,567
Jhunjhunu, India, 16,874
Jibhalanta (Uliassutai), Mongolia, 6,000
Jidda, Saudi Arabia, 80,000
Jihlava, Czech., 34,744
Jijiga, Ethiopia, 11,000
Jimma, Ethiopia, 15,000
Jind, India, 14,909
Jinja, Uganda, 29,741
Jinotepe, Nicaragua, 7,095
Jinsen (Inch'ŏn), S. Korea, 402,009
Jiparaná (river), Brazil
Jirgalanta (Kobdo), Mongolia, 10,000
João Pessoa (Paraíba), Brazil, 89,517
Jódar, Spain, 11,980
Jodhpur, India, 224,723
Jogjakarta (Djokjakarta), Indonesia, 289,422
Johannesburg, Transv., †1,096,541
Johnston (island), Pacific, 69
Johnstone, Scotland, 18,369
Johore Bahru, Malaya, 75,080
Joinville, Brazil, 20,951
Joliet, Ill., 66,780
Joliette, Quebec, 18,088
Jones (cape), Quebec
Jönköping, Sweden, 50,522
Jonquière, Quebec, 28,588
Jordan (river)
Jorhat, India, 11,664
Jos, Nigeria, 11,854
Joseph Bonaparte (gulf), Aust.
Juan de Fuca (strait), No. Amer.
Juan Fernández (islands), Chile
Juárez (Ciudad Mante), Mexico, 22,701
Juàzeiro do Norte, Brazil, 53,421
Juba, Sudan, 7,900
Juba (river), Somali Rep.
Jubbulpore, India, 367,215
Juchitán, Mexico, 20,031

Judenburg, Austria, 9,848
Juiz de Fora, Brazil, 124,979
Jujuy, Argentina, 31,091
Juli, Peru, 3,816
Juliaca, Peru, 20,786
Julianehaab, Greenland, †1,741
Jülich, Germany, 14,687
Jullundur, India, 221,952
Jumet, Belgium, 28,891
Jumilla, Spain, 15,745
Jumna (river), India
Junagadh, India, 58,111
Juncos, Puerto Rico, 6,247
Jundiaí, Brazil, 79,536
Juneau,* Alaska, 6,797
Junee, Australia, 3,980
Junín, Argentina, 36,149
Juquiá, Brazil, 2,573
Jur (river), Sudan
Jura (island), Scotland, 258
Jura (mountains)
Juruena (river), Brazil
Jutaí (river), Brazil
Jüterbog, Germany, 15,137
Jutiapa, Guatemala, 5,162
Jyväskylä, Finland, 39,628

K

K 2 (Godwin Austen) (mt.), India
Kaakhka, U.S.S.R., 2,072
Kabala, S. Leone, 3,064
Kabale, Uganda, 10,919
Kabansk, U.S.S.R., 2,233
Kabul,* Afghanistan, 224,134
Kadayanallur, India, 29,652
Kadiköy, Turkey, 129,584
Kadina, Australia, 1,866
Kadiri, India, 11,885
Kadiyevka, U.S.S.R., 180,000
Kadjang, Indonesia, †30,304
Kaduna, Nigeria, 10,628
Kaédi, Mauritania, 5,030
Kaesŏng, N. Korea, 139,900
Kafr Kanna, Israel, 3,530
Kafue (river), N. Rhodesia
Kagoshima, Japan, 296,003
Kagul, U.S.S.R., 7,375
Kaiapit, Terr. N.G.
Kaiapoi, New Zealand, 3,110
Kaifeng, China, 299,100
Kaikoura, New Zealand, 1,328
Kairouan, Tunisia, 32,299
Kairuku, Papua
Kaiserslautern, Germany, 86,259
Kaitaia, New Zealand, 2,706
Kaizuka, Japan, 56,166
Kajaani, Finland, 14,705
Kakabeka Falls, Ontario, 422
Kakhk, Iran, 4,978
Kakinada, India, 122,655
Käkisalmi (Priozersk), U.S.S.R., 4,132
Kalachinsk, U.S.S.R., 4,243
Kalámai, Greece, 38,211
Kalamazoo, Mich., 82,089
Kalannie, Australia, 114
Kalat, Pak., 2,009
Kalbe (Calbe), Germany, 15,161
Kalewa, Burma
Kalgan, China, 229,300
Kalgoorlie, Australia, †21,773
Kalianda, Indonesia, †31,073
Kalinin, U.S.S.R., 261,000
Kaliningrad, U.S.S.R.., 202,000
Kalisz, Poland, 67,300
Kalmar, Sweden, 30,802
Kalmykovo, U.S.S.R., 1,329
Kaluga, U.S.S.R., 133,000
Kalutara, Ceylon, 18,801
Kalyan, India, 31,356
Kálymnos, Greece, 10,211
Kama (river), U.S.S.R.
Kamaishi, Japan, 87,511
Kamakura, Japan, 98,617
Kamarhati, India, 125,312
Kambove, R.o.t. Congo, 9,195
Kamchatka (peninsula), U.S.S.R., 135,000
Kamen', U.S.S.R., 22,982
Kamenets-Podol'skiy, U.S.S.R.., 33,035
Kamensk-Shakhtinskiy, U.S.S.R., 58,000
Kamensk-Ural'skiy, U..S.S.R., 141,000
Kamenskoye, U.S.S.R., 216
Kamenz, Germany, 13,862
Kamienna Góra, Poland, 16,000
Kamina, R.o.t. Congo, 20,388
Kamloops, British Col., 10,076
Kamo, Japan, 39,292
Kampala,* Uganda, 46,735
Kampar, Malaya, 24,611
Kampen, Netherlands, 25,498
Kampot, Cambodia, 9,900
Kamptee, India, 26,930
Kamsack, Saskatchewan, 2,968
Kamyshin, U.S.S.R., 55,000
Kamyshlov, U.S.S.R., 20,000
Kanazawa, Japan, 298,972
Kanchanaburi, Thailand, 7,342
Kanchenjunga (mt.), Asia
Kanchipuram, India, 74,635
Kanchow, China, 98,600
Kandagach, U.S.S.R.
Kandahar, Afghan., 114,981
Kandalaksha, U.S.S.R., 7,799
Kandangan, Indonesia, 9,774
Kandi, Dahomey, 5,917
Kandukur, India, 10,396
Kandy, Ceylon, 57,013
Kangaroo (island), Australia, 3,285
Kangavar, Iran, 6,251
Kanggye, N. Korea, 30,013
Kanggyŏng, S. Korea, 24,554
Kanghwa (bay), S. Korea
Kangnŭng, S. Korea, 58,703
Kaniapiskau (river), Quebec
Kanibadam, U.S.S.R., 16,450
Kanin (peninsula), U.S.S.R.
Kanjiža, Yugoslavia, 11,290
Kankan, Guinea, 16,000
Kannauj, India, 21,994
Kano, Nigeria, 130,173
Kanoya, Japan, 72,498
Kanpur, India, 947,793
Kansas (river), Kans.
Kansas City, Kans., 121,901
Kansas City, Mo., 475,539
Kansk, U.S.S.R., 74,000
Kanuma, Japan, 77,927
Kanye, Bech. Pr., 22,922
Kaohsiung, China, 371,225
Kaokoveld (mts.), S.W. Africa
Kaolack, Senegal, 69,560
Kapfenberg, Austria, 23,868
Kapingamarangi (Greenwich) (atoll), Pacific, 454
Kaposvár, Hungary, 43,458
Kapsan, N. Korea, 58,077
Kapuskasing, Ontario, 6,870
Kara (sea), U.S.S.R.
Kara-Bogaz-Gol, U.S.S.R., 4,000
Kara-Kum (des.), U.S.S.R.
Karabük, Turkey, 31,483
Karacabey, Turkey, 15,985
Karachayevsk, U.S.S.R., 2,848
Karachi, Pakistan, †2,062,000
Karad, India, 17,996
Karadeniz (Bosporus) (strait), Turkey
Karaganda, U.S.S.R.., 398,000
Karaginskiy (island), U.S.S.R.
Karaikudi, India, 28,908
Karakorum (mts.), Asia
Karaköse (Ağri), Turkey, 19,786
Karaman, Turkey, 21,660
Karanja, India, 18,126
Karapinar, Turkey, 10,770
Karasburg, S.W. Africa, 2,233
Karasuk, U.S.S.R., 2,682
Karatsu, Japan, 77,825
Karauli, India, 19,177
Karbala, Iraq, 71,163
Karcag, Hungary, 26,098
Kardítsa, Greece, 23,708
Kargopol', U.S.S.R., 3,449
Kariba (lake), Africa
Karibib, South-West Africa, 1,395
Karikal, India, 70,541
Karimata (strait), Indonesia
Karisimbi (mt.), Africa
Karkala, India, 9,012
Karkur, Israel, 3,100
Karl-Marx-Stadt (Chemnitz), Ger., 286,016
Karlö (Hailuoto) (island), Finland, 1,369

Karlovac, Yugoslavia, 39,803
Karlovy Vary, Czech., 42,819
Karlshamn, Sweden, 11,597
Karlskoga, Sweden, 35,343
Karlskrona, Sweden, 33,010
Karlsruhe, Germany, 241,929
Karlstad, Sweden, 42,924
Karmakchi, U.S.S.R., 2,280
Karnal, India, 37,444
Karonga, Nyas., 300
Karpogory, U.S.S.R.., 684
Kars, Turkey, 32,046
Karsakpay, U.S.S.R.., 15,000
Karshi, U.S.S.R., 19,000
Kartaly, U.S.S.R.., 13,500
Karur, India, 27,575
Karviná, Czech., 46,842
Karwar, India, 15,812
Kasai (river), R.o.t. Congo
Kasama, N. Rhodesia, 1,383
Kasaragod, India, 11,566
Kasba (lake), N.W. Terrs.
Kaschau (Košice), Czech., 79,581
Kasganj, India, 28,465
Kashan, Iran, 45,955
Kashgar, China, 91,000
Kashing, China, 78,300
Kashiwazaki, Japan, 74,139
Kashmar, Iran, 13,299
Kasimov, U.S.S.R.., 13,007
Kaslo, British Columbia, 646
Kassa (Košice), Czech., 79,581
Kassala, Sudan, 39,074
Kassan, U.S.S.R., 6,224
Kassansay, U.S.S.R., 18,705
Kassel, Germany, 207,507
Kastamonu, Turkey, 19,450
Kastoría, Greece, 10,162
Kastrup, Denmark, 20,305
Kasur, Pakistan, 63,086
Katahdin (mountain), Maine
Katanga (prov.), R.o.t. Congo, 1,687,683
Katanning, Australia, 3,360
Katerínē, Greece, 28,046
Katha, Burma
Katherine, Australia, 606
Katihar, India, 26,326
Katmandu,* Nepal, 122,507
Katni, India, 24,630
Katowice, Poland, 268,900
Katrineholm, Sweden, 19,004
Katsena Ala, Nigeria, 1,138
Katsina, Nigeria, 52,672
Katta-Kurgan, U.S.S.R., 18,500
Kattegat (strait)
Kattowitz (Katowice), Poland, 268,900
Katwijk aan Zee, Netherlands, 22,013
Kau, Indonesia, †7,497
Kauai (island), Hawaii, 29,683
Kaufbeuren, Germany, 34,686
Kaunas, U.S.S.R., 214,000
Kaura Namoda, Nigeria, 13,068
Kavadarci, Yugoslavia, 7,550
Kavaje, Albania, 12,757
Kavali, India, 11,969
Kávalla, Greece, 44,517
Kavieng, Terr. N.G., 715
Kavir (desert), Iran
Kawagoe, Japan, 104,612
Kawaguchi, Japan, 170,066
Kawasaki, Japan, 632,975
Kaya, Upper Volta, 10,280
Kayes, Mali, 25,000
Kayseri, Turkey, 102,795
Kazalinsk, U.S.S.R.
Kazan (river), N.W. Terrs.
Kazan', U.S.S.R.,. 643,000
Kazandzhik, U.S.S.R., 2,600
Kazanlŭk, Bulgaria, 19,386
Kazbek (mtn.), U.S.S.R.
Kazerun, Iran, 30,641
Kazvin, Iran, 66,420
Kebumen, Indonesia, †64,874
Kecskemét, Hungary, 66,819
Kediri, Indonesia, 146,111
Kédougou, Senegal, 822
Kędzierzyn, Poland, 18,000
Keele (peak), Canada
Keelung, China, 197,029
Keeper (mountain), Ireland
Keer-weer (cape), Australia
Keetmanshoop, S.W. Afr., 7,989
Keewatin, Ontario, 2,197
Kefar Ata, Israel, 14,245
Kefar Sava, Israel, 17,935
Keighley, England, 55,852
Keijo (Seoul),* S. Korea, 2,444,883
Kelliher, Saskatchewan, 461
Kelmscott, Aust., 1,270
Kelowna, Br. Columbia, 13,188
Kelvington, Saskatchewan, 885
Kem', U.S.S.R., 16,700
Kemerovo, U.S.S.R., 277,000
Kemi, Finland, 28,847
Kemi (river), Finland
Kempsey, Australia, 8,016
Kempten, Germany, 43,116
Kenadsa, Algeria, 7,131
Kendal, England, 18,595
Kendal, Indonesia, 23,129
Kendari, Indonesia, †21,065
Kendawangan, Indonesia, 6,845
Kendrapara, India, 11,880
Keng Tung, Burma
Kenitra (Port-Lyautey), Morocco, 88,533
Kenmare (river), Ireland
Kenn (reef), Australia
Kennet (river), England
Keno Hill, Yukon, 100
Kénogami, Quebec, 11,816
Kenora, Ontario, 10,904
Kensington, P.E.I., 884
Kensington and Norwood, Australia, 13,476
Kentville, Nova Scotia, 4,612
Kenya (mountain), Kenya
Keonjhargarh, India, 9,004
Kepsut, Turkey, 3,908
Kerang, Australia, 3,727
Kerch', U.S.S.R., 99,000
Kerema, Papua, 292
Keren, Ethiopia, 8,000
Kerintji (mountain), Indonesia
Kerki, U.S.S.R.., 14,200
Kerkrade, Netherlands, 49,144
Kérkyra (Corfu), Greece, 26,991
Kerman, Iran, 62,157
Kermanshah, Iran, 125,439
Kerrobert, Saskatchewan, 1,220
Kersbrook, Australia, 402
Kerulen (river), Mongolia
Keşan, Turkey, 15,062
Keta, Ghana, 17,000
Ketapang, Indonesia, 4,385
Ketapang, Indonesia, †46,245
Kete Krachi, Ghana, 2,022
Kettering, England, 38,631
Kew, Australia, 33,341
Khabarovsk, U.S.S.R., 322,000
Khachmas, U.S.S.R., 3,280
Khairpur, Pakistan, 18,184
Khalturin, U.S.S.R., 4,722
Khamgaon, India, 26,402
Khammam, India, 18,982
Khan Yunis, Egypt, 11,220
Khanabad, Afghanistan, 30,000
Khandwa, India, 38,493
Khanewal, Pakistan, 37,915
Khaniá (Canea), Greece, 38,467
Khanka (lake)
Khanpur, Pakistan, 15,197
Khanty-Mansiysk, U.S.S.R.
Kharagpur, India, 147,561
Khardah, India, 9,568
Kharga (oasis), Egypt, 11,155
Khar'kov, U.S.S.R., 930,000
Kharmanlii, Bulgaria, 9,240
Kharovsk, U.S.S.R., 2,830
Khartoum,* Sudan, 93,103
Khartoum North, Sudan, 37,450
Khaskovo, Bulgaria, 27,394
Khatanga, U.S.S.R.
Khenifra, Morocco, 18,503
Kherson, U.S.S.R., 157,000
Khingan, Great (mt. range), China
Khiva, U.S.S.R., 23,700
Khmel'nitskiy, U.S.S.R., 62,000
Khodzheyli, U.S.S.R., 4,820
Khoi, Iran, 34,491
Kholm, U.S.S.R., 5,533
Kholmsk, U.S.S.R., 18,151
Khon Kaen, Thailand, 10,385
Khong, Laos
Khorat (Nakhon Ratchasima), Thailand, 21,774
Khorog, U.S.S.R., 8,000
Khorramshahr, Iran, 43,850
Khotan (Hotien), China
Khulna, Pakistan, 128,000
Khurja, India, 35,376
Khurramabad, Iran, 38,676
Khushab, Pakistan, 20,467
Khyber (pass), Pakistan
Kiamusze, China, 146,000
Kian, China, 52,800
Kiaochow (bay), China
Kidal, Mali, 800
Kidderminster, England, 40,822
Kiel, Germany, 273,277
Kielce, Poland, 83,000
Kienteh, China
Kieta, Terr. New Guinea, 242
Kiev, U.S.S.R., 1,102,000

* designates capitals

† designates inclusion of suburbs

Kiffa, Mauritania, 4,655
Kigali,* Rwanda, 1,850
Kigoma, Tanganyika, 1,000
Kikakyushu, Japan, 986,401
Kikinda, Yugoslavia, 33,906
Kikori, Papua, 113
Kikwit, R.o.t. Congo, 15,111
Kilimanjaro (mountain), Tanganyika
Kilis, Turkey, 33,289
Kilkenny, Ireland, 10,158
Kilkís, Greece, 10,963
Killarney, Ireland, 6,824
Killarney, Manitoba, 1,729
Kilmarnock, Scotland, 47,509
Kilosa, Tang., 4,500
Kilwa Kivinje, Tang., 3,000
Kim, U.S.S.R., 1,029
Kimberley, Br. Columbia, 6,013
Kimberley, C. of G. Hope, †77,180
Kinabalu (mountain), No. Borneo
Kincardine, Ontario, 2,841
Kindersley, Saskatchewan, 2,990
Kindia, Guinea, 12,600
Kindu, R.o.t. Congo, 20,754
Kineshma, U.S.S.R., 84,000
King (island), Tas., Australia, 2,784
King (sound), Australia
King Leopold (mt. range), Australia
King William's Town, C. of G. Hope, 14,646
Kingaroy, Australia, 4,914
Kingoonya, Australia, 112
King's Lynn, England, 27,554
Kings Peak (mountain), Utah
Kingscote, Australia, 739
Kingsgate, Br. Columbia, 35
Kingston, Australia, 963
Kingston,* Jamaica, †380,757
Kingston, Ontario, 53,526
Kingston-on-Thames, Eng., 36,450
Kingston-upon-Hull (Hull), England, 303,268
Kingstown,* St. Vincent, 16,141
Kingstown (Dún Laoghaire), Ireland, 47,803
Kingsville, Ontario, 3,041
Kingswood, England, 25,419
Kingtehchen, China, 92,000
Kinhwa, China, 46,200
Kinistino, Saskatchewan, 764
Kinnairds Head (prom.), Scotland
Kinsale, Ireland, 1,587
Kintampo, Ghana, 2,829
Kintyre (peninsula), Scotland
Kinuso, Alberta, 323
Kioga (lake), Uganda
Kirchheim, Germany, 25,007
Kirensk, U.S.S.R.
Kirikkale, Turkey, 42,838
Kirin, China, 435,400
Kirkağaç, Turkey, 11,337
Kirkby-in-Ashfield, England, 21,690
Kirkcaldy, Scotland, 52,371
Kirkee, India, 26,285
Kirkintilloch, Scotland, 18,257
Kirkland Lake, Ontario, 17,329
Kirklareli, Turkey, 20,246
Kirkuk, Iraq, 147,806
Kirkwall, Scot., 4,348
Kirov, U.S.S.R., 252,000
Kirovabad, U.S.S.R., 116,000
Kirovakan, U.S.S.R., 14,000
Kirovgrad, U.S.S.R., 34,700
Kirovo, U.S.S.R., 4,874
Kirovograd, U.S.S.R., 127,000
Kirovsk, U.S.S.R., 29,000
Kirsanov, U.S.S.R., 23,546
Kirşehir, Turkey, 20,229
Kiruna, Sweden, 26,703
Kiryu, Japan, 123,010
Kirzhach, U.S.S.R., 5,035
Kisarazu, Japan, 52,689
Kiselevsk, U.S.S.R., 130,000
Kishangarh, India, 14,459
Kishinev, U.S.S.R., 214,000
Kishiwada, Japan, 120,265
Kishorganj, Pakistan, 19,034
Kiskundorozsma, Hungary, 8,705
Kiskunfélegyháza, Hungary, 33,187
Kiskunhalas, Hungary, 26,461
Kiskunmajsa, Hungary, 13,013
Kislovodsk, U.S.S.R., 79,000
Kismayu, Somali Rep., 10,386
Kississing, Manitoba, 500
Kisújszállás, Hungary, 13,790
Kisumu, Kenya, 10,899
Kita, Mali, 3,200
Kitale, Kenya, 6,338
Kitami, Japan, 66,932
Kitchener, Ontario, 74,485
Kitchener, Greater, Ontario, 154,864
Kitega, Burundi, 2,000
Kitimat, Br. Columbia, 8,217
Kitwanga, Br. Columbia, 175
Kitzbühel, Austria, 7,743
Kitzingen, Germany, 17,784
Kiuchüan, China, 246,873
Kiukiang, China, 64,600
Kivu (lake), Africa
Kizel, U.S.S.R., 60,000
Kizlyar, U.S.S.R., 14,800
Kizyl-Arvat, U.S.S.R., 12,630
Kizyl-Atrek, U.S.S.R.
Kizyl-Kiya, U.S.S.R., 15,104
Kjölen (mt. range)
Kladno, Czech., 49,561
Klagenfurt, Austria, 69,193
Klaipėda, U.S.S.R., 89,000
Klamath (river), U.S.
Klang Malaya, 75,649
Klar (river), Sweden
Klatovy, Czech., 14,004
Klaypeda (Klaipėda), U.S.S.R., 89,000
Klemtu, Br. Columbia, 150
Kletskaya, U.S.S.R., 2,622
Kleve (Cleves), Germany, 21,483
Klin, U.S.S.R., 53,000
Klinsty, U.S.S.R., 22,229
Kłodzko (Glatz), Poland, 21,900
Kloppenburg, Germany, 15,214
Kluane (lake), Yukon
Kluang, Malaya, 31,183
Kluczbork, Poland, 13,300
Klukhori (Karachayevsk), U.S.S.R., 2,848
Klyuchevsk, U.S.S.R., 5,500
Klyuchevskaya Sopka (volcano), U.S.S.R.
Knittelfeld, Austria, 14,261
Knoxville, Tenn., 111,827
Knurów, Poland, 14,100
Knysna, C. of G. Hope, 11,085
Kobayashi, Japan, 43,894
Kobdo, Mongolia, 10,000
Kobe, Japan, 1,113,977
Köbenhavn (Copenhagen), *Denmark, 721,381
Koblenz (Coblenz), Germany, 99,240
Kobrin (Kobryn), U.S.S.R., 10,101
Kocaeli (Izmit), Turkey, 73,705
Kochevo, U.S.S.R., 600
Kochi, Japan, 196,288
Koesfeld, Germany, 20,348
Koforidua, Ghana, 35,000
Kofu, Japan, 160,963
Kogaluk (river), Quebec
Kogarah, Australia, 46,600
Köge, Denmark, 12,294
Kohat, Pakistan, 40,534
Koi (Coi) (river), N. Vietnam
Koil (Aligarh), India, 183,753
Kok-Yangak, U.S.S.R., 8,416
Kokan-Kishlak, U.S.S.R., 2,011
Kokand, U.S.S.R., 105,000
Kokchetav, U.S.S.R., 40,000
Kokiu, China, 159,700
Kokkola (Gamlakarleby), Finland, 16,190
Koko Nor (lake), China
Kokoda, Papua
Kola (peninsula), U.S.S.R.
Kolaka, Indonesia, †18,671
Kolar, India, 19,006
Kolar Gold Fields, India, 146,200
Kolarovgrad (Shumen), Bulgaria, 41,670
Kolding, Denmark, 35,101
Kolguyev (island), U.S.S.R., 300
Kolhapur, India, 187,306
Kolín, Czech., 23,225
Köln (Cologne), Germany, 809,247
Kołobrzeg, Poland, 13,200
Kolomna, U.S.S.R., 100,000
Kolonodale, Indonesia
Kolozsvár (Cluj), Rumania, 154,723
Kolpashevo, U.S.S.R.
Kolpino, U.S.S.R., 17,317
Kolwezi, R.o.t. Congo, 47,772
Kolyma (river), U.S.S.R.
Kolyma (Gydan) (mt. range), U.S.S.R.
Komandorskiye (islands), U.S.S.R.

Komárno (Komorn), Czech., 24,009
Komatsu, Japan, 89,085
Kommunarsk, U.S.S.R., 98,000
Komotinē, Greece, 28,355
Kompong Chhnang, Cambodia, 8,180
Kompong Speu, Cambodia, 6,200
Komsomol'sk, U.S.S.R., 177,000
Konakry (Conakry),* Guinea, 38,000
Konan (Hungnam), N. Korea, 143,600
Kondopoga, U.S.S.R., 14,000
Kongju, S. Korea, 27,071
Kongmoon, China, 85,000
Kongolo, R.o.t. Congo 9,061
Kongsberg, Norway, 9,731
Königgrätz (Hradec Králové), Czech., 55,147
Königsberg (Kaliningrad), U.S.S.R., 202,000
Königshütte (Chorzów), Poland, 146,700
Konin, Poland, 16,700
Köniz, Switzerland, 27,243
Konnagar and Rishra, India, 37,432
Konotop, U.S.S.R., 53,000
Konstantinovka, U.S.S.R., 89,000
Konstantinovskoye, U.S.S.R., 2,988
Konstanz (Constance), Germany, 52,651
Kontagora, Nigeria, 3,826
Kontum, S. Vietnam, 14,358
Konya, Turkey, 122,704
Kopbal, India, 13,970
Köpenick, Germany, 113,851
Kopeysk, U.S.S.R., 160,000
Koprivnica, Yugoslavia, 9,902
Korat (Nakhon Ratchasima), Thai., 21,744
Korbach, Germany, 15,084
Korçë Albania, 31,833
Korea (peninsula)
Korea (strait)
Korhogo, Ivory Coast, 15,000
Koriyama, Japan, 102,636
Korkino, U.S.S.R., 85,000
Korneuburg, Austria, 8,286
Kornwestheim, Germany, 26,296
Koror,* Palau Islands, 1,207
Korosten', U.S.S.R., 12,012
Korsakov, U.S.S.R., 23,600
Korsør, Denmark, 14,276
Kortkeros, U.S.S.R., 1,472
Kortrijk (Courtrai), Belgium, 43,070
Koryak (mtn. range), U.S.S.R.
Koschagyl, U.S.S.R.
Kościan, Poland, 15,200
Kosciusko (mountain), Australia
Košice, Czech., 79,581
Koslan, U.S.S.R., 598
Köslin (Koszalin), Poland, 41,000
Kosovska Mitrovica, Yugoslavia, 17,195
Kosti, Sudan, 29,900
Kostroma, U.S.S.R., 171,000
Koswig, Germany, 11,705
Koszalin (Köslin), Poland, 41,000
Kota, India, 119,845
Kota Bharu, Malaya, 38,096
Kota Kota, Nyas., 7,500
Kotaagung, Indonesia, †25,314
Kotabaharu, Indonesia
Kotabaru, Indonesia, 3,756
Kotabaru (Hollandia),* West Irian, 15,153
Kotamobagu, Indonesia
Kotel'nich, U.S.S.R.
Kothen, Germany, 42,588
Kotka, Finland, 30,313
Kotlas, U.S.S.R.
Kotor, Yugoslavia, 3,814
Kotovsk, U.S.S.R.
Kotrang, India, 9,401
Kotri, Pakistan, 15,154
Kottayam, India, 33,364
Kottbus (Cottbus), Germany, 49,131
Kotto (river), Cent. Afr. Rep.
Koudougou, Upper Volta, 20,822
Koulikoro, Mali, 4,500
Kouroussa, Guinea, 5,500
Koutiala, Mali, 2,942
Kouvola, Finland, 18,215
Kovel' (Kowel), U.S.S.R., 27,650
Kovrov, U.S.S.R., 100,000
Kovur, India, 10,601
Kowloon, Hong Kong, 699,500
Kozan, Turkey, 15,200
Kozáne, Greece, 21,537
Kozhikode (Calicut), India, 158,724
Kraaifontein, C. of G. Hope, 4,832
Kragan, Indonesia, 23,786
Kragujevac, Yugoslavia, 44,271
Kraków (Cracow), Poland, 479,000
Kraksaan, Indonesia, †29,466
Kraljevo (Rankovićevo), Yugoslavia, 15,152
Kramatorsk, U.S.S.R., 115,000
Kranj, Yugoslavia, 5,553
Krasnaya Polyana, U.S.S.R., 4,360
Kraśnik, Poland, 12,500
Krasnoarmeysk, U.S.S.R., 4,444
Krasnoborsk, U.S.S.R., 989
Krasnodar, U.S.S.R., 312,000
Krasnokamsk, U.S.S.R., 54,000
Krasnoslobodsk, U.S.S.R., 7,176
Krasnotur'insk, U.S.S.R., 62,000
Krasnoufimsk, U.S.S.R., 21,600
Krasnoural'sk, U.S.S.R., 35,000
Krasnovishersk, U.S.S.R., 14,000
Krasnovodsk, U.S.S.R., 30,000
Krasnoyarsk, U.S.S.R., 409,000
Krasnystaw, Poland, 11,300
Krasnyy Bor, U.S.S.R., 3,623
Krasnyy Liman, U.S.S.R.
Krasnyy Luch, U.S.S.R., 94,000
Kratié, Cambodia, 9,965
Krefeld, Germany, 213,104
Kremenchug, U.S.S.R., 86,000
Krems, Austria, 21,005
Krētē (Crete) (island), Greece, 483,075
Kribi, Cam., 2,056
Krishna (river), India
Krishnagar, India, 32,026
Kristiansand, Norway, 27,909
Kristianstad, Sweden, 25,763
Kristiansund, Norway, 17,187
Kristinehamn, Sweden, 21,604
Krivoy Rog, U.S.S.R., 386,000
Križevci, Yugoslavia, 5,591
Krnov, Czechoslovakia, 21,550
Kroměříž, Czechoslovakia, 20,583
Kronshtadt, U.S.S.R., 45,000
Kroonstad, O.F.S., 42,331
Kropotkin, U.S.S.R., 54,000
Krosno, Poland, 19,600
Krotoszyn, Poland, 17,900
Krui, Indonesia, 3,860
Krung Kao (Ayutthaya), Thailand, 15,821
Krung Thep (Bangkok),* Thailand, 1,089,800
Kruševac, Yugoslavia, 16,638
Kryukovo, U.S.S.R., 957
Ksar-es-Souk, Morocco, 7,039
Kuala Lumpur,* Malaya, 316,230
Kuala Trengganu, Malaya, 29,436
Kualakapuas, Indonesia, 8,682
Kuandang, Indonesia, †15,379
Kuban' (river), U.S.S.R.
Kubeno (lake), U.S.S.R.
Kuching,* Sara., 50,579
Kudat, No. Borneo, 3,660
Kudus, Indonesia, 62,130
Kudymkar, U.S.S.R., 10,200
Kufra (oasis), Libya, 4,600
Kufstein, Austria, 11,196
Kukawa, Nigeria, 20,000
Kukmor, U.S.S.R., 7,900
Kuldja, China, 108,200
Kulebaki, U.S.S.R., 15,142
Kulmbach, Germany, 23,467
Kulyab, U.S.S.R., 6,700
Kuma (river), U.S.S.R.
Kumagaya, Japan, 98,168
Kumamoto, Japan, 373,922
Kumanovo, Yugoslavia, 30,734
Kumasi, Ghana, 181,000
Kumbakonam, India, 67,008
Kumta, India, 12,466
Kungrad, U.S.S.R., 3,125
Kungur, U.S.S.R., 65,000
Kuningan, Indonesia, †77,181
Kunlun (mt. range), China
Kunming, China, 698,900
Kunsan, S. Korea, 90,481
Kuntsevo, U.S.S.R., 128,000
Kuolayarvi (Kuolajärvi), U.S.S.R.
Kuopio, Finland, 45,030
Kupang, Indonesia, 7,171
Kupyansk, U.S.S.R., 15,156
Kurashiki, Japan, 125,097
Kŭrdzhali, Bulgaria, 10,480
Kure, Japan, 210,032
Kuressaare, U.S.S.R., 4,478
Kurgan, U.S.S.R., 145,000
Kurgan-Tyube, U.S.S.R., 6,000

* designates capitals

† designates inclusion of suburbs

Kuria Muria (islands), Aden Prot., 100
Kuril (isls.), U.S.S.R., 6,000
Kurla, India, 39,066
Kurnool, India, 100,849
Kursk, U.S.S.R., 203,000
Kurume, Japan, 138,804
Kurunegala, Ceylon, 13,510
Kusaie (island), Caroline Is., 1,865
Kushiro, Japan, 150,624
Kushka, U.S.S.R., 3,450
Kushva, U.S.S.R., 35,200
Kuskokwim (river), Alaska
Kustanay, U.S.S.R., 86,000
Kut, Iraq, 81,388
Kütahya, Turkey, 39,851
Kutaisi, U.S.S.R., 128,000
Kutaradja, Indonesia, 26,082
Kutch (region), India, 695,704
Kutna Hora (Kuttenberg), Czech. 16,875
Kutno, Poland, 25,500
Kutoardjo, Indonesia, 44,962
Kuva, U.S.S.R., 5,907
Kuybyshev, U.S.S.R.., 806,000
Kuybyshevka-Vostochnaya (Belogorsk), U.S.S.R.
Kuybyshevo, U.S.S.R., 5,536
Kuybyshevo, U.S.S.R., 5,424
Kuzino, U.S.S.R., 5,000
Kuznetsk, U.S.S.R., 57,000
Kuzomen', U.S.S.R., 533
Kwajalein (island), Marshall Is., 1,081
Kwando (river), Africa
Kwangju, S. Korea, 315,124
Kweilin, China, 145,100
Kweisui (Huhehot), China, 148,400
Kweiyang, China, 270,900
Kwilu (river), R.o.t. Congo
Kyaikto, Burma
Kyakhta, U.S.S.R., 12,300
Kyangin, Burma
Kyaukpadaung, Burma
Kyaukpyu, Burma
Kyaukse, Burma, 8,117
Kyŏmip'o, N. Korea, 53,035
Kyŏngju, S. Korea, 76,032
Kyŏngsŏng (Seoul),* S. Korea, 2,444,883
Kyoto, Japan, 1,284,818
Kyshtovka, U.S.S.R.., 1,430
Kyshtym, U.S.S.R., 38,400
Kytlym, U.S.S.R., 6,500
Kyushu (island), Japan, 12,903,515
Kyustendil, Bulgaria, 19,309
Kywebwe, Burma
Kyzyl, U.S.S.R., 34,000
Kyzyl-Kum (desert), U.S.S.R.
Kzyl-Orda, U.S.S.R., 66,000

L

L'Aquila, Italy, 24,843
La Barca, Mexico, 16,330
La Carolina, Spain, 13,112
La Ceiba, Honduras, 24,868
La Chaux-de-Fonds, Switz., 38,906
La Chorrera, Panama, 13,696
La Ciotat, France, 10,819
La Coruña, Spain, †177,502
La Flèche, France, 8,380
La Gloria, Colombia, 1,331
La Grand' Combe, France, 9,689
La Guaira, Venezuela, 20,681
La Línea, Spain, 35,446
La Malbaie, Quebec, 2,580
La Orotava, Canary Is., Spain, †22,371
La Paz, Argentina, 15,006
La Paz,* Bolivia, 350,142
La Paz, Mexico, 23,324
La Pérouse (strait), Asia
La Piedad, Mexico, 24,306
La Plata, Argentina, †330,310
La Quiaca, Argentina, 6,768
La Rioja, Argentina, 23,164
La Roche-sur-Yon, France, 16,735
La Rochelle, France, 56,056
La Romana, Dom. Rep., 24,058
La Ronge, Saskatchewan, 707
La Serena, Chile, 46,689
La Seyne-sur-Mer, France, 11,086
La Solana, Spain, 13,653
La Spezia, Italy, 105,301
La Tuque, Quebec, 13,023
La Unión, Chile, 11,558
La Unión, El Salvador, 10,687
La Vega, Dominican Rep., 19,884
Labé, Guinea, 3,472
Łabedy, Poland, 13,800
Labelle, Quebec, 1,224
Laboulaye, Argentina, 9,032
Labrador (terr.), Newf., 13,534
Lábrea, Brazil, 2,080
Labuha, Indonesia
Labuhan, Indonesia, †22,259
Labuhanbilik, Indonesia
Lac-au-Saumon, Quebec, 1,548
Lac-Bouchette, Quebec, 911
Lac-Edouard, Quebec, 250
Lac-Frontière, Quebec, 619
Lac-la-Biche, Alberta, 1,314
Laccadive (islands), India, 12,115

Lacepede (bay), Australia
Lacepede (islands), Australia
Lachine, Quebec, 38,630
Lachlan (river), Australia
Lachute, Quebec, 7,560
Lacombe, Alberta, 3,029
Ladoga (Ladozhskoye) (lake), U.S.S.R.
Ladysmith, Br. Columbia, 2,173
Ladysmith, Natal, 22,997
Lae, Terr. N. Guinea, 4,146
Laflèche, Saskatchewan, 749
Laghouat, Algeria, 20,344
Lagos, Mexico, 23,298
Lagos,* Nigeria, 267,407
Lagos, Portugal, 7,143
Laguna, Brazil, 9,459
Laham, Indonesia
Lahat, Indonesia, †25,781
Lahej, South Arabia, 11,000
Lahore, Pakistan, 1,297,000
Lahr, Germany, 22,599
Lahti, Finland, 66,571
Lais, Indonesia, †13,201
Laiwui, Indonesia
Lajes, Brazil, 14,596
Lake Cargelligo, Australia, 1,118
Lake Louise, Alberta, 113
Lakhdenpokh'ya (Lahdenpohja), U.S.S.R.., 1,832
Lakhtinskiy, U.S.S.R., 1,229
Lal'sk, U.S.S.R.., 1,784
Lambay (island), Ireland
Lamego, Portugal, 7,449
Lamía, Greece, 21,509
Lammermuir (hills), Scotland
Lamongan, Indonesia, †34,825
Lampang, Thai., 22,405
Lampertheim, Germany, 19,218
Lamphun, Thailand, 7,896
Lamu, Kenya, 5,868
Lanai (island), Hawaii, 3,136
Lanark, Scotland, 8,436
Lancaster, England, 48,887
Lancaster (sound), N.W. Terrs.
Lanchow, China, 397,400
Lanciano, Italy, 12,000
Łańcut, Poland, 9,106
Lândana, Angola, 819
Landau, Germany, 28,725
Landerneau, France, 9,363
Landeshut (Kamienna Góra), Poland, 16,000
Land's End (cape), England
Landsberg, Germany, 13,413
Landsberg (Gorzów Wielkopolski) Poland, 50,700
Landshut, Germany, 49,514
Landskrona, Sweden, 28,820
Lang Son, N. Vietnam
Langenbielau (Bielawa), Poland, 27,000
Langenburg, Saskatchewan, 757
Langsa, Indonesia, †47,044
Lansing,* Mich., 107,807
Lanús, Argentina, 381,561
Lao Kay, N. Vietnam
Laoag, Philippine Is., †50,096
Laon, France, 19,295
Lappeenranta, Finland, 21,592

*** designates capitals** **† designates inclusion of suburbs**

Laptev (sea), U.S.S.R.
Lar, Iran, 14,188
Larache, Morocco, 31,504
Laramie (mt. range), Wyo.
Larantuka, Indonesia
Larder Lake, Ontario, 1,894
Lárisa, Greece, 55,391
Larkana, Pakistan, 33,247
Larnaca, Cyprus, 19,824
Larne, N. Ireland, 16,341
Larvik, Norway, 10,632
Las Flores, Argentina, 9,287
Las Lomitas, Argentina, 4,000
Las Palmas,* Canary Is., Spain, †193,862
Las Vegas, Nev., 64,405
Lascahobas, Haiti, 2,356
Lashio, Burma
Lashkar and Gwalior, India, 300,513
Lassen Peak (mountain), Calif.
Latacunga, Ecuador, 10,340
Latakia, Syria, 67,799
Latouche Treville (cape), Aust.
Latur, India, 24,985
Lauban (Lubań), Poland, 14,300
Launceston, Australia, †56,721
Lauria, Italy, 4,530
Lauritsala, Finland, 11,647
Lausanne, Switzerland, 126,328
Laval, France, 30,119
Lavello, Italy, 14,563
Laverton, Australia, 57
Lavongai (island), Territory N.G., 5,500
Lawang, Indonesia, †40,239
Lawrence, Mass., 70,933
Le Chesnay, France, 8,315
Le Creusot, France, 27,394
Le Havre, France, 137,175
Le Locle, Switzerland, 13,762
Le Mans, France, 103,346
Le Port, Réunion, 7,232
Le Puy, France, 19,636
Leader, Saskatchewan, 1,211
Leaf (river), Quebec
Leamington, England, 43,236
Leamington, Ontario, 9,030
Leatherhead, England, 35,554
Lębork (Lauenburg), Poland, 21,100
Lebrija, Spain, 12,903
Lebyazh'ye, U.S.S.R., 2,307
Lecce, Italy, 56,937
Lecco, Italy, 41,684
Ledo, India
Leduc, Alberta, 2,356
Lee (river), Ireland
Leech (lake), Minn.
Leeds, England, 510,597
Leek, England, 19,175
Leer, Germany, 20,548
Leeuwarden, Netherlands, 81,458
Leeuwin (cape), Australia
Legaspi, Philippine Is., 60,768
Leghorn, Italy, 134,513
Legionowo, Poland, 18,900
Legnica (Liegnitz), Poland, 61,500
Lehrte, Germany, 21,264
Leiah, Pakistan, 14,913
Leicester, England, 273,298
Leichhardt (river), Australia
Leiden, Netherlands, 96,592
Leigh, England, 46,153
Leipzig, Germany, 607,655
Leiria, Portugal, 7,123
Lekitobi, Indonesia
Lemberg (L'vov), U.S.S.R., 410,000
Lemgo, Germany, 21,365
Lēmnos (island), Greece, 21,808
Lena (river), U.S.S.R.
Leninabad, U.S.S.R., 77,000
Leninakan, U.S.S.R., 108,000
Leningrad, U.S.S.R.., 2,888,000
Leninogorsk, U.S.S.R., 67,000
Leninsk, U.S.S.R., 14,808
Leninsk-Kuznetskiy, U.S.S.R., 132,000
Lenkoran', U.S.S.R., 24,000
Lens, France, 34,134
Lentini, Italy, 28,999
Leoben, Austria, 36,313
Léogane, Haiti, 3,922
León, Mexico, 209,469
León, Nicaragua, 30,544
León, Spain, †73,483
Leonforte, Italy, 17,699
Leonora, Australia, 970
Léopold II (lake), R.o.t. Congo
Léopoldville,* R.o.t. Congo, 389,547
Leoville, Saskatchewan, 416
Lepaya (Liepāja), U.S.S.R., 71,000
Lepel', U.S.S.R., 6,776
Lerdo, Mexico, 17,537
Lérida, Spain, †63,850
Les Cayes, Haiti, 13,088
Les Méchins, Quebec, 1,049
Les Sables d'Olonne, France, 17,411
Lesbos (island), Greece, 117,371
Leskovac, Yugoslavia, 24,553
Lesogorsk, U.S.S.R.., 18,618
Lesozavodsk, U.S.S.R., 10,500
Lesser Antilles (islands)
Lesser Slave (lake), Alta.
Leszno, Poland, 28,900
Letchworth, England, 25,515
Lethbridge, Alberta, 35,454
Leticia, Colombia, 1,898
Letpadan, Burma
Leuser (mountain), Indon.
Leuven (Louvain), Belgium, 33,551
Levack, Ontario, 3,178
Levádeia, Greece, 12,609
Levallois-Perret, France, 61,348
Lévêque (cape), Australia
Leverkusen, Germany, 94,641
Levice, Czech., 13,768
Levikha, U.S.S.R., 2,100
Lévis, Quebec, 15,112
Levskigrad, Bulgaria, 8,862
Levuka, Fiji Islands, 1,944
Lewis (dist.), Scotland, 21,921
Lewisporte, Newf., 2,702
Lhasa, China, 50,000
Lhokseumawe, Indonesia, 2,043
Liaoyang, China, 150,000
Liaoyüan, China, 120,100
Liard (river), Canada
Liberec, Czech., 65,267
Libourne, France, 14,581
Libreville,* Gabon, 28,837
Libyan (desert)
Licata, Italy, 35,871
Lice, Turkey, 6,720
Lichtenberg, Germany, 157,721
Lida, U.S.S.R., 19,490
Lidcombe, Australia, 20,286
Lidice, Czech.
Lidingö, Sweden, 29,330
Lidköping, Sweden, 16,894
Lidzbark Warminski, Poland, 10,500
Liège (Luik), Belgium, 155,042
Liegnitz (Legnica), Poland, 61,500
Lienz, Austria, 11,115
Liepāja, U.S.S.R., 71,000
Lier (Lierre), Belgium, 28,781
Liévin, France, 15,272
Liffey (river), Ireland
Ligurian (sea)
Lille, France, 190,078
Lillehammer, Norway, 5,982
Lillooet, Br. Columbia, 1,304
Lima,* Peru, †1,389,000
Limassol, Cyprus, 43,593
Limay (river), Argentina
Limbach, Germany, 17,693
Limbe-Blantyre, Nyas., 24,380
Limburg, Germany, 15,578
Limeira, Brazil, 45,256
Limerick, Ireland, 50,497
Limmen Bight (bay), Australia
Limoges, France, 98,405
Limón, Costa Rica, 16,238
Limonade, Haiti, 1,209
Limpopo (river), Africa
Linares, Chile, 27,568
Linares, Spain, 44,093
Lincoln, Argentina, 12,695
Lincoln, England, 77,065
Lincoln,* Nebr., 128,521
Lindau, Germany, 24,187
Lindesnes (cape), Norway
Lindi, Tang., 10,315
Lindsay, Ontario, 11,399
Lingayen, Philippine Is., †45,039
Lingeh, Iran, 4,920
Lingen, Germany, 25,162
Linguère, Senegal, 1,324
Linköping, Sweden, 65,082
Lins, Brazil, 32,204
Linz, Austria, 196,206
Lions (gulf), France
Lion's Head, Ontario, 416
Lipari (islands), Italy, 11,799
Lipetsk, U.S.S.R., 156,000
Lipno, Poland, 10,200
Lipova, Rumania, 10,064
Lippstadt, Germany, 37,502
Lisbon (Lisboa),* Portugal, 818,382
Lisburn, N. Ireland, 17,691
Lisieux, France, 14,511
Lismore, Australia, 18,935

Listowel, Ontario, 4,002
Lithgow, Australia, 14,229
Litoměrice, Czech., 16,884
Little Colorado (river), U.S.
Little Current, Ontario, 1,527
Little Minch (channel), Scotland
Little Missouri (river), U.S.
Little Rock,* Ark., 107,813
Litvínov, Czech., 20,235
Liuchow, China, 158,800
Liverpool, Australia 31,969
Liverpool, England, 747,490
Liverpool, Nova Scotia, 3,712
Liverpool (bay), England
Livingstone, N. Rhodesia, 12,278
Livny, U.S.S.R., 19,873
Livorno (Leghorn), Italy, 134,513
Livramento, Brazil, 37,666
Lizard Head (point), England
Ljubljana, Yugoslavia, 133,386
Llandudno, Wales, 16,715
Llanelly, Wales, 29,994
Llera, Mexico, 1,653
Lleyn (peninsula), Wales
Lloydminster, Sask., 5,667
Llullaillaco (mountain), Chile
Loange (river), Angola
Löbau, Germany, 15,361
Lobaye (river), Cent. Afr. Rep.
Lobito, Angola, 23,897
Lobos, Argentina, 8,372
Lobos de Afuera (islands), Peru
Lobos de Tierra (island), Peru
Lobva, U.S.S.R., 5,200
Locarno, Switzerland, 10,155
Lochy (lake), Scotland
Lockeport, Nova Scotia, 1,231
Lod (Lydda), Israel, 19,012
Lodi, Italy, 30,217
Łódź, Poland, 708,400
Lofoten (islands), Norway, 29,375
Logan (mountain), Yukon
Logone (river)
Logroño, Spain, †61,292
Loheia (Luhaiya), Yemen, 6,000
Loikaw, Burma
Loire (river), France
Loja, Ecuador, 23,757
Lokeren, Belgium, 25,948
Lokoja, Nigeria, 8,085
Lokot', U.S.S.R., 5,675
Lom, Bulgaria, 15,182
Lom Sak, Thailand, 6,243
Lomami (river), R.o.t. Congo
Lomas de Zamora, Argentina, †275,219
Lombok (island), Indonesia, 1,252,157
Lomé,* Togo, 69,448
Lomela (river), R.o.t. Congo
Lomond (lake), Scotland
Lomonosov, U.S.S.R.
Łomża, Poland, 20,300
London (Adm. County-City), England, 3,195,114
London, Greater,* England, 8,171,902
London, Ontario, 169,569
London, Greater, Ont., 181,283
Londonderry (cape), Australia
Londonderry, N. Ireland, 53,744
Londrina, Brazil, 74,110
Long (island), N.Y.
Long (island), Bahama Is., 3,755
Long (reef), Australia
Long Beach, Calif., 344,168
Long Eaton, England, 30,464
Long Island (sound), U.S.
Long Xuyen, S. Vietnam, 18,800
Longford, Australia, 1,767
Longiram, Indonesia, 7,776
Longlac, Ontario, 1,144
Longnawan, Indonesia, †16,234
Longreach, Australia, 3,806
Longwy, France, 4,420
Lons-le-Saunier, France, 14,247
Loop Head (cape), Ireland
Lop Nor (lake), China
Lop Buri, Thai., 7,779
Lopatka (cape), U.S.S.R.
Lopez (cape), Gabon
Lorca, Spain, 21,057
Lorica, Colombia, 6,146
Lorient, France, 37,981
Lorne (firth), Scotland
Lörrach, Germany, 30,536
Los Angeles, Calif., 2,479,015
Los Angeles, Chile, 35,511
Los Mochis, Mexico, 37,682
Los Toldos, Arg., 5,342
Lota, Chile, 48,693
Louga, Senegal, 16,280
Lough Swilly (inlet), Ireland
Loughborough, England, 38,621
Louis Trichardt, Trans., 9,703
Louisburg, Nova Scotia, 1,417
Louisiade (archipelago), Papua, 10,384
Louisville, Ky., 390,639
Lourdes, France, 14,110
Lourenço Marques,* Mozambique, 183,798
Louvain, Belgium, 33,551
Louviers, France, 8,720
Lovat' (river), U.S.S.R.
Lovech, Bulgaria, 11,730
Low (cape), N.W. Terrs.
Lowell, Mass., 92,107
Lower California (pen.), Mexico, 604,346
Lower Post, Br. Columbia, 160
Lower Tunguska (river), U.S.S.R.
Lowestoft, England, 45,687
Lowicz, Poland, 17,600
Loxton, Australia, 2,057
Loyalty (islands), New Caledonia, 11,100
Loyang, China, 171,200
Lualaba (river), R.o.t. Congo
Luanda,* Angola, 141,722
Luang Prabang, Laos, 8,000
Luangwa (river), N. Rhodesia
Luapula (river), Africa
Lubań, Poland, 14,300
Lubbock, Tex., 128,691
Lübeck, Germany, 234,643
Lublin, Poland, 180,700
Lubliniec, Poland, 14,400
Lubny, U.S.S.R., 21,302
Lucca, Italy, 63,667
Lucena, Philippine Is., 49,265
Lucena, Spain, 22,797
Lucenec, Czech., 16,102
Lucera, Italy, 22,271
Lucerne, Switz., 67,433
Luchow, China, 289,000
Łuck (Lutsk), U.S.S.R., 49,000
Luckenwalde, Germany, 30,979
Lucknow, India, 662,196
Lüdenscheid, Germany, 58,239
Lüderitz, S.W. Africa, 3,604
Ludhiana, India, 244,238
Ludwigsburg, Germany, 73,512
Ludwigshafen, Germany, 165,761
Ludwigslust, Germany, 12,487
Luebo, R.o.t. Congo, 17,826
Luga, U.S.S.R., 24,200
Lugano, Switzerland, 19,758
Lugansk, U.S.S.R.,. 274,000
Luganville (Segond), New Hebrides
Lugenda (river), Mozambique
Lugh, Somali Rep., †2,810
Lugo, Italy, 16,084
Lugo, Spain, †58,264
Lugoj, Rumania, 30,252
Luhaiya, Yemen, 6,000
Luik (Liège), Belgium, 155,042
Luilaka (river), R.o.t. Congo
Luimneach (Limerick), Ireland, 50,497
Luján, Argentina, 19,176
Lukenie (river), R.o.t. Congo
Lukovit, Bulgaria, 7,755
Łuków, Poland, 10,700
Lukuga (river), R.o.t. Congo
Luleå, Sweden, 30,488
Luleälv (river), Sweden
Lüleburgaz, Turkey, 18,355
Lulua (river), R.o.t. Congo
Luluabourg, R.o.t. Congo, 59,535
Lumadjang, Indonesia, †55,700
Lumsden, Saskatchewan, 685
Lund, Sweden, 40,331
Lundy (island), England, 43
Lüneburg, Germany, 59,574
Lünen, Germany, 72,171
Lunenburg, Nova Scotia, 3,056
Lunéville, France, 20,512
Lungchen, China, 14,000
Luque, Paraguay, 5,519
Lurin, Peru, 2,714
Lusaka,* N. Rhodesia, 19,825
Lusambo, R.o.t. Congo, 9,201
Luscar, Alberta, 500
Lüshun (Port Arthur), China, 126,000
Luso, Angola, 2,821
Lustenau, Austria, 12,554
Lut (desert), Iran
Lüta, China, 1,200,000
Luton, England, 131,505
Lutsk, U.S.S.R., 49,000
Luwingu, N. Rhodesia, 540
Luxembourg (Luxemburg), *Luxembourg, 70,652
Luxor, Egypt, 34,555
Luzern (Lucerne), Switz., 67,433
Luzon (island), Phil. Islands, 9,074,974
L'vov (Łwów), U.S.S.R., 410,000
Lyakhov (islands), U.S.S.R.

Lyallpur, Pakistan, 426,000
Lydda (Lod), Israel, 19,012
Lydenburg, Transv., 7,393
Lyme (bay), England
Lymington, England, 28,642
Lynn Lake, Manitoba, 1,218
Lyon, France, 462,657
Lyons (river), Australia
Lys'va, U.S.S.R., 73,000
Lytton, Br. Columbia, 442
Lyubertsy, U.S.S.R., 93,000
Lyublino, U.S.S.R., 86,000

M

Ma'ad, Jordan, 8,629
Ma'an, Jordan, 6,899
Maastricht, Netherlands, 86,665
Macaé, Brazil, 19,830
Macao (Macau),* Macao, 153,630
Macapá, Brazil, 27,585
Macas, Ecuador, 1,079
Macclesfield, England, 37,578
Macdonald (lake), Australia
Macdonnell (mt. ranges), Aust.
Maceió, Brazil, 153,305
Macerata, Italy, 21,875
Machala, Ecuador, 7,491
Mackay, Australia, 16,809
Mackay (lake), Australia
Mackenzie (bay), Canada
Mackenzie (river), N.W. Terrs.
Macklin, Saskatchewan, 690
Maclear, C. of G. Hope, 3,542
Mâcon, France, 20,226
Macon, Ga., 69,764
Macquarie (harbor), Tas., Aust.
Ma'daba, Jordan, 11,255
Madagascar (island), 5,486,713
Madang, Terr. N.G., 1,550
Madaripur, Pakistan, 21,005
Madeira (island), Port., 279,611
Madeira (river), Brazil
Madhubani, India, 20,272
Madison,* Wis., 126,706
Madiun, Indonesia, 90,778
Madjalengka, Indonesia, †47,055
Madjene, Indonesia, †37,727
Madoc, Ontario, 1,347
Madras, India, †1,725,216
Madre (lagoon), U.S.-Mex.
Madre de Dios (island), Chile
Madre de Dios (river), S.A.
Madre del Sur (mt. range), Mex.
Madre Occidental (mt. range), Mexico
Madre Oriental (mt. range), Mexico
Madrid,* Spain, †2,259,931
Madurai (Madura), India, 424,975
Mae Klong, Thailand, 9,332
Maebashi, Japan, 181,937
Maestricht (Maastricht), Netherlands, 86,665
Maevatanana, Malg. Rep., 2,775
Mafeking, C. of G. Hope, 8,279
Mafeking, Manitoba, 278
Mafia (island), Tang., 9,000
Magadan, U.S.S.R., 62,000
Magangué, Colombia, 9,770
Magdalen (islands), Quebec, 12,479
Magdalena, Argentina, 4,114
Magdalena (river), Colombia
Magdeburg, Germany, 258,447
Magdiel, Israel, 4,850
Magelang, Indonesia, 81,799
Magellan (strait), S.A.
Magetan, Indonesia, †54,159
Maglie, Italy, 12,404
Magnitogorsk, U.S.S.R., 311,000
Magog, Quebec, 13,139
Magpie, Quebec, 359
Magrath, Alberta, 1,338
Magwe, Burma, 9,353
Maha Sarakham, Thai., 11,816
Mahabad, Iran, 20,332
Mahaica, British Guiana, 486
Mahanadi (river), India
Mahbubnagar, India, 16,462
Mahe, India, 18,293
Mahébourg, Maur., 6,020
Mahoba, India, 17,224
Mahón, Balearic Is., Spain, 14,237
Mahone Bay, N.S., 1,103
Mährisch Ostrau (Ostrava), Czech., 234,671
Mahuva, India, 22,058
Maida, Yemen, 2,500
Maidenhead, England, 35,374
Maidstone, England, 59,761
Maidstone, Saskatchewan, 577
Maiduguri, Nigeria, 24,359
Maimana, Afghan., 30,000
Main (river), Germany
Maintirano, Malg. Rep., 2,742
Mainz, Germany, 134,375
Maipú (mountain), Argentina
Maisons-Alfort, France, 35,578
Maisons-Laffitte, France, 13,074
Maitland, Australia, †27,353
Maizuru, Japan, 99,615
Maji, Ethiopia, 3,000
Majunga, Malg. Rep., 34,119
Makarikari Pan (salt lake), Bech. Prot.
Makassar, Indonesia, 357,415
Makassar (strait), Indonesia
Makeni, S. Leone, 7,500
Makeyevka, U.S.S.R., 358,000
Makhachkala, U.S.S.R., 119,000
Makhnevo, U.S.S.R., 540
Makin (island), Gilbert Is., 969
Makó, Hungary, 29,935
Maku, Iran, 6,668
Makurdi, Nigeria, 7,655
Malacca, Malaya, 69,851
Malacca (strait)
Malad, India, 12,212
Málaga, Spain, †301,048
Malaita (island), Sol. Is. Prot., 40,000
Malakal, Sudan, 12,150
Malakoff, France, 27,424
Malamir, Iran, 2,001
Malang, Indonesia, 300,651
Malange, Angola, 22,390
Malartic, Quebec, 6,998
Malatya, Turkey, 84,162
Malay (peninsula), Asia
Malayer (Daulatabad), Iran, 21,105
Malbork (Marienburg), Poland, 24,500
Maldive (islands), 81,950
Maldonado, Uruguay, 11,400
Malegaon, India, 121,427
Maler Kotla, India, 29,321
Malheur (lake), Oreg.
Malili, Indonesia, 5,735
Malin Head (cape), Ireland
Malinau, Indonesia, 9,677
Malindi, Kenya, 3,292
Malines (Mechelen), Belgium, 64,720
Malingping, Indonesia, †41,284
Malkapur, India, 20,598
Mallow, Ireland, 5,729
Malmesbury, C. of G. Hope, 8,206
Malmö, Sweden, 228,878
Malolos, Philippine Is., †49,267
Maltahöhe, S.W. Africa, 1,044
Malvan, India, 25,677
Malvern, England, 24,373
Mam Soul (mountain), Scotland
Mamoré (river), Bolivia
Mampawah, Indonesia
Mamudju, Indonesia, †47,309
Man (island), 48,150
Mana, Fr. Guiana, 1,443
Manacor, Balearic Is., Spain, 12,823
Manado, Indonesia, 68,000
Managua,* Nicaragua, 109,352
Manakara, Malg. Rep., 11,507
Manakha, Yemen, 3,000
Manama,* Bahrein, 55,541
Mananjary, Malg. Rep., 15,579
Manatí, P.R., 9,682
Manaus, Brazil, 154,040
Manchester, England, 661,041
Manchester, N.H., 88,282
Manchouli, China, 45,000
Mandalay, Burma, 182,367
Mandi, India, 9,033
Mandla, India, 12,209
Mandsaur, India, 21,972
Mandurah, Australia, 2,132
Manduria, Italy, 21,584
Mandvi, India, 28,750
Manfalût, Egypt, 20,939

* designates capitals

† designates inclusion of suburbs

Manfredonia, Italy, 26,682
Mangalia, Rumania, 4,792
Mangalore, India, 142,231
Mangareva (Gambier) (islands), Fr. Polynesia, 554
Mangotsfield, England, 24,092
Mangrol, India, 18,818
Mangueira (lake), Brazil
Manicoré, Brazil, 2,268
Manicouagan (river), Quebec
Manifold (cape), Australia
Manila, Philippine Is., 1,145,723
Manilla, Australia, 1,914
Manisa, Turkey, 59,223
Manitoba (lake), Man.
Manitoulin (isl.), Ont.
Maniwaki, Quebec, 6,349
Manizales, Colombia, †161,000
Manly, Australia, 36,049
Manmad, India, 16,838
Mannar (gulf), India
Mannargudi, India, 23,288
Mannheim, Germany, 313,890
Mannville, Alberta, 632
Manokwari, West Irian
Manresa, Spain, 36,934
Mansel (island), N.W. Terrs.
Mansfield, England, 53,222
Manta, Ecuador, †31,800
Mantes-Gassicourt, France, 13,055
Mantua (Mantova), Italy, 48,250
Manyberries, Alberta, 130
Manzanares, Spain, †17,847
Manzanillo, Cuba, 42,252
Manzanillo, Mexico, 16,591
Mao, Chad, 3,000
Maple Creek, Sask., 2,291
Mapuera (river), Brazil
Maquela do Zombo, Angola, 1,103
Mar del Plata, Arg., 114,729
Maraba, Brazil, 8,533
Maracá (island), Brazil
Maracaibo, Venezuela, 421,166
Maracaibo (lake), Venezuela
Maracaju, Brazil, 1,848
Maracay, Venezuela, †135,353
Maragheh, Iran, 36,551
Marajó (island), Brazil
Marand, Iran, 13,822
Maranguape, Brazil, 8,715
Marañón (river), Peru
Maraş, Turkey, 54,646
Marathon, Greece, 2,167
Marathon, Ontario, 2,568
Marble (island), N.W. Terrs.
Marble Bar, Australia, 201
Marburg, Germany, 44,853
Marchena, Spain, 17,030
Marcos Paz, Argentina, 4,115
Marcus (island), Pacific
Mardan, Pakistan, 48,827
Mardin, Turkey, 27,390
Margão, India, 17,933
Margaree Harbour, N.S., 108
Margaret Bay, Br. Columbia, 50
Margarita (island), Venezuela, 76,035
Margate, England, 45,708
Margelan, U.S.S.R., 68,000
Margherita, Som. Rep., †19,209
Mariana (islands), Pacific, 6,286
Marianao, Cuba, 219,278
Maribor, Yugoslavia, 82,387
Marienberg, Terr. N.G.
Marienburg (Malbork), Poland, 24,500
Mariinsk, U.S.S.R., 21,000
Marion (reef), Australia
Mariscal Estigarribia, Paraguay, 3,684
Maritsa (river)
Mariupol' (Zhdanov), U.S.S.R., 284,000
Markhamat, U.S.S.R., 3,468
Marks, U.S.S.R., 12,461
Marktredwitz, Germany, 15,523
Marmande, France, 8,536
Marmara (sea), Turkey
Maroantsetra, Malg. Rep., 4,880
Maroni (river), S.A.
Maros, Indonesia
Maroua, Cam., 14,029
Marovoay, Malg. Rep., 13,960
Marquesas (isls.), Fr. Polynesia, 2,976
Marra (mountain), Sudan
Marrakesh, Morocco, 253,141
Marree, Australia, 278
Marsala, Italy, 42,488
Marseille, France, 661,492
Marshall (islands), Pacific, 11,033
Martaban, Burma
Martapura, Indonesia, †153,216
Martin, Czech., 22,440
Martina Franca, Italy, 24,609
Martinique (isl.), 277,000
Marton, New Zealand, 4,319
Martos, Spain, 17,481
Martre (lake), N.W. Terrs.
Marugame, Japan, 37,312
Mary, U.S.S.R., 48,000
Maryborough, Australia, 7,235
Maryborough, Australia, 19,126
Marysville, N.B., 3,233
Más Afuera (island), Chile
Más Atierra (island), Chile
Masamba, Indonesia, †15,152
Masan, S. Korea, 157,547
Masaya, Nicaragua, 16,743
Mascara, Algeria, 26,086
Mascarene (islands), Africa
Maseru,* Basutoland, 2,600
Masindi, Uganda, 1,571
Masira (island), Oman
Masisea, Peru, 1,520
Mask (lake), Ireland
Masqat,* Oman, 5,500
Massa, Italy, 45,108
Massafra, Italy, 16,106
Massawa, Ethiopia, 9,000
Massey, Ontario, 1,324
Masterton, New Zealand, 15,128
Masulipatnam, India, 101,396
Matachewan, Ontario, 938
Matadi, R.o.t. Congo, 59,184
Matagalpa, Nicaragua, 10,323
Matam, Senegal, 2,425
Matamoros (Coahuila), Mexico, 13,572
Matamoros (Tamaulipas), Mexico 93,334
Matane, Quebec, 9,190
Matanzas, Cuba, 63,916
Matapédia, Quebec, 1,100
Matara, Ceylon, 23,434
Mataram, Indonesia
Matarani, Peru
Mataranka, Australia, 70
Mataró, Spain, 28,797
Matehuala, Mexico, 19,738
Matera, Italy, 30,009
Matheson, Ontario, 853
Mathura, India, 123,808
Mati, Philippine Islands, 2,899
Matlock, England, 18,486
Mato Grosso, Brazil, 520
Mato Grosso (plateau), Brazil
Matochkin Shar, U.S.S.R.
Matosinhos, Portugal, 29,078
Matrah, Oman, 8,500
Matruh, Egypt, 3,047
Matsudo, Japan, 56,053
Matsue, Japan, 108,476
Matsumoto, Japan, 148,710
Matsusaka, Japan, 98,441
Matsuyama, Japan, 238,604
Mattancheri, India, 53,346
Mattawa, Ontario, 3,314
Maturín, Venezuela, †54,250
Mau, India, 29,357
Maubeuge, France, 20,310
Maubin, Burma, 9,637
Maués, Brazil, 4,161
Maui (island), Hawaii, 40,103
Maumere, Indonesia
Maun, Bech. Pr., 2,500
Mauna Kea (mtn.), Hawaii
Mauna Loa (mtn.), Hawaii
Maurice (lake), Australia
Mauritius (island), 501,471
Mawlaik, Burma
May (cape), N. J.
Mayaguana (isl.), Bah. Is., 615
Mayagüez, Puerto Rico, 50,147
Mayavaram (Mayuram), India, 32,670
Mayen, Germany, 17,268
Mayerthorpe, Alberta, 663
Maykop, U.S.S.R., 82,000
Mayo, Yukon, 342
Mayuram, India, 32,670
Mazabuka, N. Rhodesia, 11,720
Mazagan, Morocco, 41,812
Mazamet, France, 13,705
Mazar-i-Sharif, Afghan., 30,695
Mazara del Vallo, Italy, 31,744
Mazatenango, Guatemala, 11,067
Mazatlán, Mexico, 74,934
Mazzarino, Italy, 17,844
M'Bout, Mauritania, 1,800
Mbabane,* Swaz., 2,000
Mbarara, Uganda, 3,844
McBride, Br. Columbia, 590
McCreary, Manitoba, 563
McKenzie Island, Ont., 1,450
McKinlay, Australia, 71
McKinley (mountain), Alaska
McLennan, Alberta, 1,078
McMurray, Alta., 1,186

* designates capitals

† designates inclusion of suburbs

Mead (lake), U.S.
Meadow Lake, Sask., 2,803
Meaford, Ontario, 3,834
Meaux, France, 13,030
Mecca,* Saudi Arabia, 150,000
Mechelen (Malines), Belgium, 64,720
Méchéria, Algeria, 5,121
Mechigmen, U.S.S.R.
Mechtal (Miechowice), Poland, 12,672
Medan, Indonesia, 338,553
Medellín, Colombia, †578,940
Médenine, Tunisia, 3,564
Medgidia, Rumania, 17,943
Mediaş, Rumania, 32,498
Medicine Bow (mt. range), U.S.
Medicine Hat, Alberta, 24,484
Medina, Saudi Arabia, 15,000
Medina del Campo, Spain, †14,327
Mediterranean (sea)
Mednogorsk, U.S.S.R.
Medvezh'yegorsk, U.S.S.R., 13,400
Meekatharra, Australia, 640
Meerane, Germany, 26,804
Meerut, India, 283,878
Meester Cornelis (Djatinegara), Indonesia
Mégantic, Quebec, 7,015
Mégara, Greece, 15,450
Megiddo, Israel, 82
Mehsana, India, 16,986
Meiktila, Burma, 12,321
Meiningen, Germany, 23,700
Meissen, Germany, 48,348
Meknes, Morocco, 186,837
Mekong (river)
Melanesia (isls.), Pacific
Melbourne, Australia, †1,911,895
Melekess, U.S.S.R., 51,000
Meleuz, U.S.S.R., 5,724
Melfort, Saskatchewan, 4,039
Melilla, Spain, 79,056
Melipilla, Chile, 14,467
Melita, Manitoba, 1,038
Melitopol', U.S.S.R.., 95,000
Melo, Uruguay, 28,673
Melrhir (lake), Algeria
Melun, France, 18,391
Melville, Saskatchewan, 5,191
Melville (bay), Australia
Melville (cape), Australia
Melville (island), Australia
Melville (lake), Newf.
Melville (peninsula), N.W. Terrs.
Memel (Klaipėda), U.S.S.R., 89,000
Memmingen, Germany, 29,801
Memphis, Tenn., 497,524
Menai (strait), Wales
Mendi, Papua
Mendip (hills), England
Mendocino (cape), Calif.
Mendoza, Argentina, 109,149
Mendoza, Mexico, 16,031
Menemen, Turkey, 15,118
Menfi, Italy, 16,644
Menggala, Indonesia, 20,343
Mengtsz, China, 193,004
Menindee, Australia, 644
Menton, France, 16,421
Menzel Bourguiba, Tunisia, 29,353
Menzies, Australia, 137
Merak, Indonesia, †36,293
Merano, Italy, 26,551
Merauke, West Irian
Mercedes, Argentina, 30,575
Mercedes, Argentina, 16,932
Mercedes, Uruguay, 28,433
Mergui, Burma, 33,604
Mérida, Mexico, 170,513
Mérida, Spain, 23,001
Mérida, Venezuela, †46,409
Mérida (mt. range), Venezuela
Merka, Somali Rep., †60,371
Merksem, Belgium, 35,260
Merredin, Australia, 3,029
Merritt, Br. Columbia, 3,039
Merseburg, Germany, 33,978
Mersin (Içel), Turkey, 68,574
Merthyr Tydfil, Wales, 59,008
Merv (Mary), U.S.S.R., 48,000
Merzifon, Turkey, 22,173
Mesagne, Italy, 20,486
Meshed, Iran, 241,989
Mesopotamia (region), Iraq
Messina, Italy, 208,762
Messina (strait), Italy
Messina, Transv., 10,225
Mestre, Italy, 73,435
Meta (river), S.A.
Metz, France, 81,096
Meudon, France, 20,106
Meulaboh, Indonesia, 6,544
Meuse (river)
Mexico (gulf)
Mexico City (México),* Mexico, †3,795,567
Mezen', U.S.S.R., 2,952
Mezen' (river), U.S.S.R.
Mezőberény, Hungary, 13,126
Mezőkövesd, Hungary, 18,640
Mezőtúr, Hungary, 23,632
Mhow, India, 34,823
Miami, Fla., 291,688
Mianeh, Iran, 21,100
Mianwali, Pakistan, 23,340
Miass, U.S.S.R., 19,378
Michigan (lake), U.S.
Michikamau (lake), Newf.
Michipicoten Harbour, Ont., 136
Michurinsk, U.S.S.R., 80,000
Micronesia (isls.), Pacific
Middleburg, C. of G. Hope, 8,711
Middleburg, Netherlands, 22,408
Middleburg, Transv., 12,907
Middlesbrough, England, 157,308
Middleton, Nova Scotia, 1,921
Midland, Ontario, 8,656
Midland Junction, Aust., 9,256
Midnapore, India, 43,171
Midway (isls.), Pacific
Miechowice, Poland, 12,672
Międzyrzec Podlaski, Poland, 10,700
Mielec, Poland, 21,800
Miercurea Ciuc, Rumania, 11,996
Mihara, Japan, 70,650
Mikhaylovgrad, Bulg., 8,067
Mikhaylovka, U.S.S.R., 12,944
Mikindani, Tanganyika, 4,807
Mikkeli (Sankt Michel), Finland, 19,782
Mikołów, Poland, 17,100
Milan (Milano), Italy, 1,267,040
Milâs, Turkey, 11,670
Milazzo, Italy, 16,129
Mildura, Australia, 12,279
Miles, Australia, 1,457
Milestone, Saskatchewan, 465
Milford Haven (inlet), Wales
Miling, Australia, 404
Milk (river), Canada
Milk (river), U.S.
Milk River, Alberta, 801
Millau, France, 16,990
Mille Lacs (lake), Minn.
Millerovo, U.S.S.R., 12,822
Milltown, New Brunswick, 1,892
Milwaukee, Wis., 741,324
Minamata, Japan, 48,342
Minas, Uruguay, 21,133
Minatitlán, Mexico, 34,980
Minbu, Burma, 6,404
Mindanao (island), Philippine Islands, 2,427,587
Minden, Germany, 48,705
Mindoro (island), Philippine Islands, 167,705
Mineral del Monte, Mex., 10,090
Mingan, Quebec, 60
Mingenew, Australia, 668
Minho (river), Portugal
Minitonas, Manitoba, 606
Minna, Nigeria, 2,590
Minneapolis, Minn., 482,872
Minnedosa, Manitoba, 2,211
Miño (river), Spain
Minsk, U.S.S.R., 509,000
Mińsk Mazowiecki, Pol., 18,800
Minto, New Brunswick, 1,549
Minto (lake), Quebec
Minton, Saskatchewan, 208
Minusinsk, U.S.S.R., 21,427
Minya Konka (mountain), China
Miraj, India, 32,455
Miranda, Brazil, 2,075
Miranda de Ebro, Spain, 15,922
Miri, Sarawak, 13,183
Mirim (lake), South America
Mirpur, India, 8,556
Mirpur Khas, Pakistan, 40,412
Mirtóön (sea), Greece
Mirzachul' U.S.S.R., 4,600
Mirzapur, India, 100,127
Mishima, Japan, 58,179
Miskolc, Hungary, 143,364
Missinaibi (river), Ont.
Mississippi (delta), La.
Mississippi (river), U.S.
Missolonghi, Greece, 11,266
Missouri (river), U.S.
Mistassini, Quebec, 3,461
Mistassini (lake), Quebec
Místek-Frýdek, Czech., 26,573
Misti (mountain), Peru
Mistretta, Italy, 11,638
Misurata, Libya, †34,451
Mitchell, Australia, 1,822
Mitchell (river), Australia

Mitchell (mountain), N.C.
Mito, Japan, 110,436
Mittweida, Germany, 22,794
Mitú, Colombia, 312
Miyako, Japan, 55,385
Miyakonojo, Japan, 92,230
Miyazaki, Japan, 158,328
Mizda, Libya, 1,000
Mizen Head (cape), Ireland
Mizil, Rumania, 7,460
Mladá Boleslav, Czech., 25,694
Mladenovac, Yugoslavia, 6,231
Mlanje (mountain), Nyasaland
Mława, Poland, 15,400
Mobile, Ala., 202,779
Moca, Dominican Rep., 13,829
Moçambique, Mozambique, 12,493
Moçâmedes, Angola, 13,591
Mocha, Yemen, 600
Mochudi, Bech. Pr., 11,767
Mocoa, Colombia, 1,446
Modasa, India, 11,598
Modena, Italy, 82,180
Modica, Italy, 27,730
Modjokerto, Indonesia, 50,622
Mödling, Austria, 17,339
Moengo, Surinam, 1,890
Mogadishu,* Somali Rep., 80,698
Mogador, Morocco, 29,309
Mogilev, U.S.S.R., 121,000
Mogilev-Podol'skiy, U.S.S.R., 22,993
Mogok, Burma
Mohács, Hungary, 18,045
Moineşti, Rumania, 12,934
Moisie, Quebec, 351
Moisie (river), Quebec
Mojave (desert), Calif.
Moknine, Tunisia, 15,699
Mokp'o, S. Korea, 129,667
Mola di Bari, Italy, 22,402
Molchanovo, U.S.S.R.., 794
Molenbeek-Saint-Jean, Belgium, 63,898
Molepolole, Bech. Pr., 14,805
Molfetta, Italy, 55,150
Mollendo, Peru, 13,574
Mölln, Germany, 13,774
Mölndal, Sweden, 26,428
Molodechno (Molodeczno), U.S.S.R., 26,000
Molokai (island), Hawaii, 5,280
Molopo (river), Africa
Molotov (Perm), U.S.S.R., 628,000
Molotovsk (Severodvinsk), U.S.S.R., 79,000
Molotovsk (Nolinsk), U.S.S.R., 5,517
Mombasa, Kenya, 84,746
Mominabad, India, 16,250
Momostenango, Guat., 5,002
Mompós, Colombia, 9,192
Mon Cay, N. Vietnam
Mona (passage)
Monaco,* Monaco, 2,422
Monchegorsk, U.S.S.R., 30,000
Mönchengladbach, Ger., 152,185
Monclova, Mexico, 43,333
Moncton, New Brunswick, 43,840

Mondovi, Italy, 13,736
Monfalcone, Italy, 24,160
Monghyr, India, 63,150
Mongolian (plateau), Mong.
Mongu, N. Rhodesia, 1,761
Monopoli, Italy, 23,233
Monreale, Italy, 21,396
Monrovia,* Liberia, 41,829
Mons (Bergen), Belgium, 26,124
Mont-de-Marsan, France, 11,929
Mont-Joli, Quebec, 6,178
Mont-Laurier, Quebec, 5,859
Mont-Louis, Quebec, 500
Montague, P.E.I., 1,126
Montague (sound), Australia
Montargis, France, 14,154
Montauban, France, 24,664
Montbéliard, France, 13,596
Monte Bello (islands), Australia
Monte Carlo, Monaco, 7,967
Monte Caseros, Arg., 11,409
Monte Sant'Angelo, Italy, 26,700
Montecristi, Dom. Rep., 5,912
Montego Bay, Jamaica, 23,822
Montélimar, France, 10,567
Monterey (bay), Calif.
Montería, Colombia, 96,150
Monterrey, Mexico, 596,993
Montes Claros, Brazil, 40,545
Montevideo,* Uruguay, 777,885
Montgomery,* Ala., 134,393
Montgomery, Pakistan, 75,000
Montigny, France, 12,726
Montilla, Spain, 18,541
Montluçon, France, 46,994
Montmagny, Quebec, 6,850
Montmorency, Quebec, 5,985
Montpelier,* Vt., 8,782
Montpellier, France, 83,890
Montréal, Quebec, 1,191,062
Montréal, Greater, Quebec, 2,109,509
Montreal Lake, Saskatchewan, 25
Montreuil, France, 69,698
Montreux-le-Châtelard, Switzerland, 12,222
Montrose, Scotland, 10,702
Montrouge, France, 34,508
Monumbo, Terr. N.G.
Monywa, Burma, 13,414
Monza, Italy, 69,263
Monze, N. Rhodesia, 616
Moonbeam, Ontario, 500
Moonta, Australia, 1,151
Moora, Australia, 1,145
Moorreesburg, C. of G. Hope, 3,840
Moose (lake), Man.
Moose Factory, Ontario, 400
Moose Jaw, Sask., 33,206
Moosehead (lake), Maine
Moosomin, Saskatchewan, 1,781
Moosonee, Ontario, 214
Mopti, Mali, 8,564
Moquegua, Peru, 7,697
Moradabad, India, 198,081
Moramanga, Malg. Rep., 6,302

Moratuwa, Ceylon, 50,093
Morava (river), Yugoslavia
Moravská Ostrava (Ostrava), Czech., 234,671
Morawa, Australia, 469
Morawhanna, Br. Guiana, 305
Moray (firth), Scotland
Morden, Manitoba, 2,793
Mordialloc, Australia, 26,526
Morecambe, England, 40,950
Moree, Australia, 6,795
Morelia, Mexico, 100,258
Morena (mt. range), Spain
Moriguchi, Japan, 68,204
Morinville, Alberta, 935
Morioka, Japan, 157,441
Morlaix, France, 12,929
Morley, England, 40,322
Mormugão (Vasco da Gama), India, 14,140
Mornington, Australia, 4,886
Mornington (island), Australia
Morobe, Terr. N.G.
Morogoro, Tang., 14,507
Moroleón, Mexico, 17,955
Morombe, Malg. Rep., 5,375
Morón, Arg., 25,000
Morón, Cuba, 18,629
Morón de la Frontera, Spain, 22,091
Morondava, Malg. Rep., 10,683
Moroni, Comoro Is., 6,545
Morphou, Cyprus, 6,642
Morris, Manitoba, 1,370
Morshansk, U.S.S.R., 27,779
Mortara, Italy, 11,074
Mortes (river), Brazil
Morvi, India, 37,048
Moscow (Moskva),* U.S.S.R., 5,032,000
Mosel (Moselle) (river)
Moshi, Tanganyika, 13,726
Moskva (river), U.S.S.R.
Mosonmagyaróvár, Hungary, 21,199
Mosquitos (gulf), Panama
Moss, Norway, 20,591
Mossâmedes (Moçâmedes), Angola, 13,591
Mossbank, Saskatchewan, 568
Mosselbaai, C. of G. Hope, 12,178
Mossoró, Brazil, 38,833
Most, Czech., 44,490
Mostaganem, Algeria, 56,446
Mostar, Yugoslavia, 35,242
Mosul, Iraq, 273,389
Motala, Sweden, 27,170
Motherwell and Wishaw, Scotland, 72,799
Motril, Spain, 19,185
Motueka, New Zealand, 3,310
Moulins, France, 22,677
Moulmein, Burma, 101,720
Moundou, Chad, 19,043
Mount Gambier, Australia, 15,388
Mount Garnet, Australia, 381
Mount Hope, Australia, 50
Mount Isa, Australia, 13,358
Mount Magnet, Australia, 648

Mount Morgan, Australia, 4,000
Mount Pleasant, Australia, 320
Mount Torrens, Australia, 234
Mountain Ash, Wales, 29,590
Mountain Park, Alberta, 400
Moura, Brazil, 185
Moura, Portugal, 9,509
Mourne (mountains), Ireland
Mouscron (Moeskroen), Belgium, 36,675
Moyale, Kenya
Moyamba, S. Leone, 2,500
Moyeuvre, France, 8,422
Moyobamba, Peru, 8,308
Mozambique (channel), Africa
Mozyr', U.S.S.R.
Mtsensk, U.S.S.R., 10,142
Muang Nan, Thailand, 10,041
Muang Phayao, Thailand, 8,253
Muang Thoen, Thailand, 5,192
Muaralabuh, Indonesia
Muarasiberut, Indonesia
Muaratewe, Indonesia, 6,135
Muck (island), Scotland, 42
Mudgee, Australia, 5,312
Muğla, Turkey, 14,035
Muharraq, Bahrein, 27,115
Mühlhausen, Germany, 48,013
Muiron (islands), Australia
Mukachevo (Mukačevo), U.S.S.R., 26,123
Mukalla, Aden Prot., 19,000
Mukdahan, Thailand, 6,847
Mukden, China, 2,299,900
Mulchén, Chile, 10,729
Mulgrave, Nova Scotia, 1,145
Mulhacén (mountain), Spain
Mülheim, Germany, 185,708
Mulhouse, France, 97,285
Mull (island), Scotland, 2,342
Mull of Galloway (cape), Scotland
Mull of Oa (cape), Scotland
Mullewa, Australia, 799
Mullingar, Ireland, 5,894
Multan, Pakistan, 358,000
München (Munich), Germany, 1,084,474
Muncie, Ind., 68,603
Mundare, Alberta, 603
Munich, Germany, 1,084,474
Munkacs (Mukachevo), U.S.S.R., 26,123
Münster, Germany 182,721
Muntok, Indonesia, †25,883
Muong May, Laos
Muonio (river), Sweden
Muradiye, Turkey, 2,281
Murchison (mountain), Australia
Murchison (mt. range), Australia
Murchison (river), Australia
Murcia, Spain, †249,738
Murmansk, U.S.S.R., 226,000
Murom, U.S.S.R., 73,000
Muroran, Japan, 145,679
Murray (river), Australia
Murray Bridge, Australia 5,404
Murree, Pakistan, 9,398
Murrumbidgee (river), Australia
Murwara (Katni), India, 24,630
Murwillumbah, Australia, 7,151
Mürzzuschlag, Austria, 11,565
Muş, Turkey, 12,015
Musala (mountain), Bulgaria
Musashino, Japan, 94,948
Muscat (Masqat),* Oman, 5,500
Musgrave (mt. ranges), Australia.
Musselburgh, Scotland, 17,273
Musselshell (river), Mont.
Mustafa Kemalpaşa, Turkey, 20,874
Muswellbrook, Australia, 5,717
Mutankiang, China, 151,400
Mutton Bay, Quebec, 110
Muttra (Mathura), India, 123,808
Muzaffarpur, India, 108,759
Múzquiz, Mexico, 12,659
Mwanza, Tanganyika, 19,877
Mweru (lake), Africa
My Tho, S. Vietnam, 53,200
Myaungmya, Burma, 10,066
Myingyan, Burma, 26,895
Myitkyina, Burma, 12,382
Mymensingh, Pakistan, 44,527
Mysłowice (Myslowitz), Poland, 41,000
Mysore, India, 253,524
Myszków, Poland, 13,500
Myszyniec, Poland, 12,465
Mytilēnē, Greece, 25,758
Mytishchi, U.S.S.R., 99,000

N

Nablus (Nabulus), Jordan, 45,658
Náchod, Czechoslovakia, 17,848
Nadiad, India, 46,510
Nadzab, Terr. New Guinea
Naestved, Denmark, 19,617
Naga, Philippine Is., 55,723
Nagahama, Japan, 18,246
Nagano, Japan, 160,522
Nagaoka, Japan, 148,254
Nagapattinam, India, 52,937
Nagasaki, Japan, 344,153
Nagaur, India, 14,714
Nagercoil, India, 106,497
Nagina, India, 26,077
Nagoya, Japan, 1,591,935
Nagpur, India, 643,186
Naguabo, Puerto Rico, 3,396
Nagykanizsa, Hungary, 34,222
Nagykörös, Hungary, 25,861
Naha,* Ryukyu Islands, †223,047
Nahariya, Israel, 14,537
Nahuel Huapi (lake), Argentina
Naihati, India, 42,200
Na'in, Iran, 4,681
Nain, Labrador, Newf., 283
Naini Tal, India, 9,539
Nairobi,* Kenya, 118,976
Najin, N. Korea, 34,338
Nakatsu, Japan, 61,667
Nakhichevan', U.S.S.R., 25,000
Nakhodka, U.S.S.R.., 63,000
Nakhon Nayok, Thailand, 6,121
Nakhon Pathom, Thailand, 16,348
Nakhon Phanom, Thai., 8,526
Nakhon Ratchasima, Thai., 21,774
Nakhon Sawan, Thai., 12,499
Nakhon Si Thammarat, Thai., 15,344
Nakina, Ontario, 892
Nakło, Poland, 13,500
Nakskov, Denmark, 16,639
Nakuru, Kenya, 17,625
Nakusp, Br. Columbia, 1,029
Nal'chik, U.S.S.R., 87,000
Nalgonda, India, 12,674
Nam Tso (lake), China
Nam Dinh, S. Vietnam, 40,000
Namangan, U.S.S.R., 122,000
Namatanai, Terr. N. Guinea, 315
Namib (desert), S.W. Africa
Namlea, Indonesia, 707
Nampula, Mozambique, 3,416
Namuli (mountain), Mozambique
Namur (Namen), Belgium, 33,343
Namwŏn, S. Korea, 39,362
Nanaimo, Br. Columbia, 14,135
Nanam, N. Korea, 20,936
Nanango, Australia, 1,314
Nanchang, China, 398,200
Nancheng, China, 50,000
Nanchung, China, 164,700
Nancy, France, 120,484
Nanded, India, 65,018
Nandurbar, India. 22,139
Nandyal, India, 25,886
Nangapinoh, Indonesia, †24,836
Nangatajap, Indonesia, †8,285
Nanking, China, 1,091,600
Nanning, China, 194,600
Nannup, Australia, 869
Nanping, China, 53,445
Nansei (Ryukyu) (islands), 883,122
Nanterre, France, 39,565
Nantes, France, 197,915
Nanton, Alberta, 1,054
Nantucket (island), Mass., 3,484
Nanyang, China, 75,000
Nanyuki, Kenya, 4,090
Náousa, Greece, 15,492
Napier, New Zealand, †32,716
Naples (Napoli), Italy, 1,096,755
Napo (river), S.A.
Nara, Japan, 134,577

Nara, Mali, 2,227
Naracoorte, Australia, 4,410
Naradhan, Australia, 85
Narathiwat, Thailand, 11,352
Narayanganj, Pakistan, 162,000
Narayanpet, India, 16,396
Narbada (river), India
Narbonne, France, 27,896
Nardò, Italy, 21,891
Narembeen, Australia, 423
Narnaul, India, 23,063
Naro, Italy, 16,309
Narrabri, Australia, 5,423
Narrandera, Australia, 4,718
Narrogin, Australia, 4,620
Narromine, Australia, 2,282
Narsinghgarh, India, 11,036
Narsinghpur, India, 12,908
Narva, U.S.S.R., 23,512
Narvik, Norway, 13,316
Nar'yan-Mar, U.S.S.R.
Narym, U.S.S.R., 1,000
Naryn, U.S.S.R., 15,000
Naryn, U.S.S.R., 2,029
Nasaud, Rumania, 5,725
Nasca, Peru, 2,175
Nashville,* Tenn., 170,874
Nasik, India, 130,834
Nasirabad, India, 17,804
Nasratabad (Zabul), Iran, 12,221
Nassau,* Bahamas, 46,125
Nässjö, Sweden, 18,427
Natagaima, Colombia, 4,066
Natal, Brazil, 154,276
Natanya, Israel, 40,907
Natashquan, Quebec, 300
Natashquan (river), Canada
Natuna (islands), Indonesia, 15,241
Naturaliste (cape), Australia
Naturaliste (channel), Australia
Nau, U.S.S.R., 2,314
Nauen, Germany, 13,106
Naumburg, Germany, 41,379
Na'ur, Jordan, 4,650
Nauru (island), Pacific, 4,606
Navan (An Uaimh), Ireland, 3,996
Navanagar (Jamnagar), India, 147,420
Navarino (island), Chile
Navojoa, Mexico, 30,762
Navrongo, Ghana, 1,170
Navsari, India, 35,445
Nawabganj, Pakistan, 23,311
Nawabshah, Pakistan, 34,201
Nazareth, Israel, 25,066
Naze, The (prom.), England
Nazilli, Turkey, 36,601
Ndola, N. Rhodesia, 16,206
Neagh (lake), Ireland
Neath, Wales, 30,884
Necochea, Argentina, 17,808
Neemuch, India, 17,074
Neepawa, Manitoba, 3,197
Nefta, Tunisia, 14,167
Nefud (desert), Saudi Arabia
Negev (region), Israel
Negoiul (mountain), Rumania
Negombo, Ceylon, 32,632
Negotin, Yugoslavia, 6,982
Negrais (cape), Burma
Negro (river), Argentina
Negro (river), S.A.
Negros (island), Phil. Is., 1,218,710
Neheim-Hüsten, Germany, 33,913
Neikiang, China, 190,200
Neisse (Nysa), Poland, 21,500
Neiva, Colombia, 71,170
Nellore, India, 106,797
Nelson, Br. Columbia, 7,074
Nelson, England, 31,950
Nelson, New Zealand, †25,321
Nelson (river), Man.
Néma, Mauritania, 1,994
Německý Brod (Havlíčkuv Brod), Czech., 14,944
Nene (river), England
Nerchinsk, U.S.S.R., 15,300
Nerchinskiy Zavod, U.S.S.R., 3,186
Nerva, Spain, 10,374
Nes Ziyona (Nes Tsiyona), Israel, 10,917
Nesher, Israel, 7,856
Ness (lake), Scotland
Netherdale, Australia, 122
Nettuno, Italy, 12,084
Neu-Ulm, Germany, 24,305
Neubrandenburg, Germany, 20,446
Neuburg, Germany, 16,502
Neuchâtel, Switzerland, 33,430
Neuilly-sur-Seine, France, 58,658
Neukölln, Germany, 285,283
Neumünster, Germany, 75,072
Neunkirchen, Austria, 10,032
Neunkirchen, Germany, 45,625
Neuquén, Argentina, 7,498
Neuruppin, Germany, 26,040
Neuss, Germany, 92,916
Neustadt (Prudnik), Poland, 14,400
Neustadt, Germany, 31,567
Neustettin (Szczecinek), Poland, 22,110
Neustrelitz, Germany, 24,692
Neuwied, Germany, 26,359
Neva (river), U.S.S.R.
Nevada (mt. range), Spain
Nevel', U.S.S.R., 12,923
Nevel'sk, U.S.S.R., 11,180
Nevers, France, 33,918
Neves, Brazil, 85,741
Neviges, Germany, 13,804
Nevşehir, Turkey, 18,808
Nev'yansk, U.S.S.R., 24,300
New (forest), England
New Amsterdam, Br. Guiana, 14,046
New Bedford, Mass., 102,477
New Britain (island), Territory N.G., 87,505
New Caledonia (island), Pacific, 64,461
New Delhi,* India, 260,272
New Georgia (island), Sol. Is. Prot., 10,000
New Glasgow, Nova Scotia, 9,782
New Guinea (island), Pacific, 2,475,000
New Haven, Conn., 152,048
New Hebrides (islands), Pacific, 47,000
New Ireland (island), Territory N.G., 33,930
New Liskeard, Ontario, 4,896
New Norfolk, Australia, 5,445
New Orleans, La., 627,525
New Plymouth, New Zealand, †32,387
New Richmond, Quebec, 648
New Siberian (islands), U.S.S.R.
New Waterford, Nova Scotia, 10,592
New Westminster, Br. Columbia, 33,654
New Windsor, England, 27,126
New York, N.Y., 7,781,984
Newark, England, 24,610
Newark, N. J., 405,220
Newbury, England, 20,386
Newcastle, Australia, †208,630
Newcastle, England, 76,433
Newcastle, Natal, 17,418
Newcastle, New Brunswick, 5,236
Newcastle-on-Tyne, England, 269,389
Newmarket, Ontario, 8,932
Newport (Hampshire), England, 19,482
Newport (Monmouthshire), England, 108,107
Newport News, Va., 113,662
Newry, N. Ireland, 12,450
Newton Abbot, England, 18,066
Newtonards, N. Ireland, 13,090
Nezhin, U.S.S.R., 41,406
Ngabang, Indonesia, †24,516
Ngami (salt lake), Bech. Prot.
N'Gaoundéré, Cam., 9,000
N'Guigmi, Niger, 2,538
Nguru, Nigeria, 23,084
Nha Trang, S. Vietnam, 60,300
Niafunké, Mali, 4,142
Niagara (falls), Canada
Niagara (falls), U.S.
Niagara Falls, N.Y., 102,394
Niagara Falls, Ontario, 22,351
Niamey,* Niger, 30,030
Nias (island), Indonesia, 224,619
Nicaragua (lake), Nicaragua
Nicastro, Italy, 25,121
Nice, France, 208,453
Nichinan, Japan, 61,974
Nicobar (islands), India, 12,452
Nicolet, Quebec, 4,441
Nicosia,* Cyprus, 45,629
Nicosia, Italy, 17,950
Niemen (river), U.S.S.R.
Nienburg, Germany, 22,055
Nieuw-Nickerie, Surinam, 3,141
Niğde, Turkey, 18,010
Niger (river), Africa
Nigríta, Greece, 9,979
Niigata, Japan, 314,528
Niihama, Japan, 125,688
Niitsu, Japan, 52,403
Nijmegen, Netherlands, 127,734
Nikko, Japan, 33,348
Nikolayev, U.S.S.R., 224,000

* designates capitals

† designates inclusion of suburbs

Nikolayevsk, U.S.S.R.
Nikolayevskiy, U.S.S.R., 19,225
Nikol'sk, U.S.S.R., 3,100
Nikol'skoye, U.S.S.R., 6,418
Nikopol', U.S.S.R., 81,000
Niksar, Turkey, 10,550
Nikšic, Yugoslavia, 10,323
Nile (river), Africa
Nimach (Neemuch), India, 17,074
Nîmes, France, 72,274
Ningpo, China, 237,500
Ningsia (Yinchwan), China, 84,000
Ninh Binh, N. Vietnam
Nioro, Mali, 5,488
Nioro-du-Rip, Senegal, 1,923
Niort, France, 30,199
Nipawin, Saskatchewan, 3,836
Nipigon, Ontario, 1,717
Nipigon (lake), Ont.
Nipissing (lake), Ont.
Nirgua, Venezuela, 7,119
Niriz, Iran, 14,946
Nirmal, India, 14,499
Niš (Nish), Yugoslavia, 81,076
Niscemi, Italy, 23,114
Nishapur, Iran, 25,820
Nishinomiya, Japan, 262,608
Nishinoomote, Japan, 32,645
Niterói, Brazil, 228,826
Nith (river), Scotland
Nitra, Czech., 34,242
Niue (island), Pacific, 4,253
Nizamabad, India, 55,202
Nizhneudinsk, U.S.S.R., 10,342
Nizhni Novgorod (Gor'kiy), U.S.S.R., 942,000
Nizhniy Tagil, U.S.S.R., 338,000
Nizhnyaya Salda, U.S.S.R., 15,166
Nizhnyaya Tura, U.S.S.R., 5,428
Nizip, Turkey, 19,295
Noakhali, Pakistan, 16,657
Noarlunga, Australia, 323
Nobeoka, Japan, 122,527
Nocera Inferiore, Italy, 32,472
Noda, Japan, 54,150
Noda (Chekhov), U.S.S.R., 7,846
Nogales, Sonora, Mexico, 37,655
Nogales, Veracruz, Mexico, 11,179
Noginsk, U.S.S.R., 93,000
Nogoa (river), Australia
Noisy-le-Sec, France, 16,103
Nokia, Finland, 18,113
Nokomis, Saskatchewan, 560
Nolinsk, U.S.S.R., 5,517
Nominingue, Quebec, 744
Nong Khai, Thai., 11,757
Nonni (river), China
Noranda, Quebec, 11,477
Nordegg, Alberta, 1,014
Norden, Germany, 16,164
Nordenham, Germany, 26,875
Nordhausen, Germany, 32,848
Nordhorn, Germany, 39,449
Nördlingen, Germany, 14,350
Nordvik, U.S.S.R.
Nore (river), Ireland
Norfolk, Va., 304,869
Norfolk (island), Australia, 942
Noril'sk, U.S.S.R., 108,000
Norman Wells, N.W. Terrs., 183
Normandin, Quebec, 1,838
Normanton, Australia, 238
Normetal, Quebec, 1,892
Norrköping, Sweden, 90,680
Norseman, Australia, 2,104
North (Nord) (cape), Iceland
North (Nordkapp) (cape), Norway
North (channel), England
North (sea), Europe
North Battleford, Sask., 11,230
North Bay, Ontario, 23,781
North Foreland (prom.), England.
North Minch (channel), Scotland
North Platte (river), U.S.
North Ronaldsay (islands), Scotland, 224
North Saskatchewan (river), Sask.
North Truchas Peak (mountain), N. Mex.
North Uist (island), Scotland, 1,890
North Vancouver, Br. Columbia, 23,656
North West (cape), Australia
North West River, Lab., Newf., 753
North York Moors (plateau), England
Northam, Australia, 7,200
Northampton, Australia, 714
Northampton, England, 105,361
Northcliffe, Australia, 578
Northeim, Germany, 19,264
Northern Dvina (river), U.S.S.R.
Northfleet, England, 22,084
Northumberland (cape), Australia
Northwich, England, 19,374
Norton (sound), Alaska
Norway House, Manitoba, 447
Norwich, England, 119,904
Noshiro, Japan, 63,002
Nosob (river), S.W. Africa
Nossi-Bé (isl.), Malg. Rep., 21,765
Noto, Italy, 21,982
Noto (peninsula), Japan
Notodden, Norway, 7,551
Nottaway (river), Quebec
Nottingham, England, 311,645
Nouakchott,* Mauritania, 10,042
Nouméa,* New Caledonia, 22,238
Nova Goa (Pangim), India, 31,950
Nova Gradiška, Yugoslavia, 7,548
Nova Lisboa, Angola, 28,297
Nova Scotia (peninsula), Canada
Nova Zagora, Bulgaria, 11,031
Novara, Italy, 65,682
Novaya Lyalya, U.S.S.R., 15,000
Novaya Zemlya (islands), U.S.S.R., 400
Nové Zámky, Czech., 22,041
Novgorod, U.S.S.R., 61,000
Novgorod-Severskiy, U.S.S.R., 10,075
Novi Ligure, Italy, 18,698
Novi Pazar, Yugoslavia, 14,104
Novi Sad, Yugoslavia, 102,385
Novi Vrbas (Vrbas), Yugoslavia, 15,470
Novo-Aydar, U.S.S.R., 5,225
Novo Mesto, Yugoslavia, 5,134
Novo-Orsk, U.S.S.R., 3,935
Novo Redondo, Angola, 1,016
Novocherkassk, U.S.S.R., 94,000
Novokuznetsk, U.S.S.R., 377,000
Novomoskovsk, U.S.S.R., 107,000
Novorossiysk, U.S.S.R., 93,000
Novosibirsk, U.S.S.R., 887,000
Novouzensk, U.S.S.R., 13,943
Novozybkov, U.S.S.R., 19,345
Nový Jičín, Czech., 16,560
Novyy Port, U.S.S.R.
Nowa Ruda, Poland, 17,800
Nowa Sól, Poland, 25,200
Nowgong, India, 12,972
Nowra, Australia, 6,221
Nowshera, Pakistan, 23,114
Nowy Bytom, Poland, 84,000
Nowy Sącz, Poland, 33,500
Nowy Targ, Poland, 15,700
Nuadibu, Mauritania, 1,500
Nubian (desert), Sudan
Nudo de Albarracín (mountain), Spain
Nueva Imperial, Chile, 6,442
Nueva San Salvador (Santa Tecla), El Salvador, 26,911
Nuevitas, Cuba, 12,300
Nuevo Laredo, Mexico, 93,787
Nukha, U.S.S.R., 26,262
Nuku'alofa,* Tonga, 6,500
Nukus, U.S.S.R., 39,000
Nullagine, Australia, 131
Nullarbor (plain), Australia
Numazu, Japan, 142,609
Nuneaton, England, 56,598
Nunkiang, China
Nuoro, Italy, 16,667
Nürnberg (Nuremberg), Germany, 454,520
Nuyts (cape), Australia
Nyala, Sudan, 4,100
Nyandoma, U.S.S.R.
Nyasa (lake), Africa
Nyborg, Denmark, 11,667
Nyíregyháza, Hungary, 56,875
Nyköbing, Denmark, 17,850
Nyköping, Sweden, 24,193
Nylstroom, Transvaal, 6,662
Nymagee, Australia, 243
Nyngan, Australia, 2,414
Nysa (Neisse), Poland, 21,500
Nyslott (Savonlinna), Finland, 14,728
N'Zerekore, Guinea, 10,500

O

Oahu (island), Hawaii, 353,020
Oakbank, Australia, 332
Oakland, Calif., 367,548
Oamaru, N.Z., 12,429
Oaxaca, Mexico, 72,313
Ob' (gulf), U.S.S.R.
Ob' (river), U.S.S.R.
Oban, Scotland, 6,859
Obbia, Somali Rep., †1,989
Oberammergau, Germany, 4,546
Oberhausen, Germany, 256,773
Obidos, Brazil, 5,901
Obihiro, Japan, 100,915
Ob'yachevo, U.S.S.R., 275
Ocaña, Colombia, 9,937
Occidental (mt. range), S.A.
Ocean (island), Pacific, 2,060
Ocean Falls, Br. Columbia, 2,832
Ochil (hills), Scotland
Ocotlán, Mexico, 25,435
October Revolution (island), U.S.S.R.
Ocumare del Tuy, Venezuela, 14,970
Odawara, Japan, 113,099
Ödemiş, Turkey, 28,525
Odense, Denmark, 111,145
Oder (Odra) (river), Europe
Odessa, U.S.S.R., 667,000
Odienné, Ivory C., 3,700
Odobeşti, Rumania, 4,977
Odorhei, Rumania, 14,162
Oels (Oléśnica), Poland, 16,050
Offenbach, Germany, 116,195
Offenburg, Germany, 27,569
Ogaki, Japan, 102,478
Ogbomosho, Nigeria, 139,535
Ogden, Utah, 70,197
Ogema, Saskatchewan, 458
Ogooué (river), Gabon
O'Higgins (lake), Chile
Ohio (river), U.S.
Ohrid, Yugoslavia, 12,640
Oirot Tura (Gorno-Altaysk), U.S.S.R., 27,006
Oita, Japan, 124,807
Ojiya, Japan, 49,445
Oka (river), U.S.S.R.
Okahandja, S.W. Africa, 2,962
Okayama, Japan, 260,773
Okazaki, Japan, 116,095
Okeechobee (lake), Fla.
Okene, Nigeria, 32,602
Okha, U.S.S.R.
Okhotsk (sea), U.S.S.R.

Oki (islands), Japan, 41,639
Okinawa (island), 759,341
Oklahoma City,* Okla., 324,253
Okovanggo (river), Africa
Oktyabr'skiy, U.S.S.R., 65,000
Ola, U.S.S.R., 271
Öland (island), Sweden, 23,265
Oława (Ohlau), Poland, 10,800
Olavarría, Argentina, 24,204
Olbernhau, Germany, 11,133
Olbia, Italy, 12,900
Old Lop (dry salt lake), China
Oldenburg, Germany, 125,163
Oldham, England, 115,426
Olds, Alberta, 2,433
Olekminsk, U.S.S.R., 2,285
Olenek, U.S.S.R.
Olenek (river), U.S.S.R.
Oléron (island), France, 12,820
Oléśnica, Poland, 16,050
Olhão, Portugal, 16,592
Olinda, Brazil, 100,545
Oliva, Spain, 17,801
Oliva de la Frontera, Spain, 11,575
Oliver, Br. Columbia, 1,774
Olkusz, Poland, 12,100
Olomouc (Olmütz), Czech., 70,116
Olonets, U.S.S.R., 1,766
Oloron, France, 8,601
Olot, Spain, 12,925
Ölsnitz, Germany, 20,034
Olsztyn, Poland, 64,300
Olt (river), Rumania
Olten, Switzerland, 20,044
Olympia,* Wash., 18,273
Olympic (mountains), Wash.
Olympus (mt.), Greece
Om' (river), U.S.S.R.
Omaha, Nebr., 301,598
Oman (gulf), Asia
Omaruru, S.W. Africa, 2,689
Omdurman, Sudan, 126,650
Omiya, Japan, 169,996
Omolon (river), U.S.S.R.
Omsk, U.S.S.R., 579,000
Omuta, Japan, 205,766
Omutninsk, U.S.S.R.
Onega, U.S.S.R.
Onega (river), U.S.S.R.
Onega (Onezhskoye) (lake), U.S.S.R.
Ongerup, Australia, 118
Ongole, India, 21,184
Onitsha, Nigeria, 65,000
Onomichi, Japan, 91,003
Onslow, Australia, 291
Ontario (lake), U.S.-Canada
Onteniente, Spain, 11,878
Oodnadatta, Australia, 137
Oostende (Ostend), Belgium, 56,335
Ootacamund, India, 29,850
Ootsa Lake, British Columbia, 50
Opatija, Yugoslavia, 6,830
Opava, Czech., 42,523
Opole (Oppeln), Poland, 56,000
Opole Lubelskie, Poland, 11,553
Oporto (Pôrto), Port., 310,474

Oradea, Rumania, 98,950
Orai, India, 17,242
Oran, Algeria, 277,772
Orán, Argentina, 6,706
Orange, Australia, 18,977
Orange, France, 10,515
Orange (river), Africa
Orangeville, Ontario, 4,593
Oranienbaum (Lomonosov), U.S.S.R.
Oranienburg, Germany, 18,633
Orăştie, Rumania, 10,488
Oraşul Stalin (Braşov), Rumania, 123,834
Oraviţa, Rumania, 8,175
Orbost, Australia, 2,613
Ord (river), Australia
Ordu, Turkey, 20,171
Ordynskoye, U.S.S.R., 3,333
Ordzhonikidze, U.S.S.R., 2,505
Ordzhonikidze, U.S.S.R., 164,000
Ordzhonikidze (Yenakiyevo), U.S.S.R., 92,000
Örebro, Sweden, 75,379
Orekhovo-Zuyevo, U.S.S.R., 108,000
Orel, U.S.S.R., 152,000
Orenburg, U.S.S.R., 260,000
Orense, Spain, †64,153
Orestiás, Greece, 10,281
Oriental (mt. range), S.A.
Orillia, Ontario, 15,345
Orinoco (plains), S.A.
Orinoco (river), Venezuela
Oristano, Italy, 13,914
Orizaba, Mexico, 69,672
Orkney (islands), Scotland, 18,743
Orlando, Fla., 88,135
Orléans, France, 71,533
Orléansville, Algeria, 12,455
Orlová, Czech., 21,463
Ormskirk, England, 21,815
Orocué, Colombia, 598
Oroquieta, Philippine Is., 29,485
Orosháza, Hungary, 32,086
Oroya, La, Peru, 24,841
Orsha, U.S.S.R., 64,000
Orsk, U.S.S.R., 176,000
Ortona, Italy, 13,697
Oruro, Bolivia, 83,689
Oryakhovo, Bulgaria, 6,972
Osa, U.S.S.R., 5,876
Osaka, Japan, 3,011,563
Oschatz, Germany, 15,331
Oschersleben, Germany, 21,011
Osh, U.S.S.R., 65,000
Oshawa, Ontario, 62,415
Oshogbo, Nigeria, 123,000
Osijek, Yugoslavia, 71,843
Osimo, Italy, 10,444
Osinniki, U.S.S.R., 68,000
Osipenko (Berdyansk), U.S.S.R., 65,000
Oskelaneo, Quebec, 250
Oslo,* Norway, 477,121
Osmanabad, India, 14,414
Osmaniye, Turkey, 29,291
Osnabrück, Germany, 138,777
Osorno, Chile, 54,693
Osoyoos, British Columbia, 1,022

Osprey (reef), Australia
Oss, Netherlands, 25,184
Ostend (Oostende), Belgium, 56,335
Östersund, Sweden, 24,777
Ostrava, Czech., 234,671
Ostróda (Osterode), Poland, 16,900
Ostrogozhsk, U.S.S.R., 22,990
Ostrołęka, Poland, 13,700
Ostrov, U.S.S.R.
Ostrów Mazowiecka, Poland, 12,500
Ostrów Wielkopolski, Poland, 42,000
Ostrowiec Świętokrzyski, Poland, 36,300
Ostuni, Italy, 24,020
Osumi (islands), Japan, 88,542
Osuna, Spain, †20,775
Oświęcim (Auschwitz), Poland, 28,800
Otaru, Japan, 198,511
Otavalo, Ecuador, 8,379
Otavi, S.W. Africa, 1,303
Otjiwarongo, S.W. Africa, 6,162
Otranto (strait), Italy
Otsu, Japan, 113,547
Ottawa,* Canada, 268,206
Ottawa, Greater, Ont., 429,750
Ottawa (islands), N.W. Terrs.
Ottawa (river), Canada
Otway (cape), Australia
Otwock, Poland, 30,700
Ouagadougou,* Upper Volta, 50,000
Ouahigouya, Upper Volta, 11,924
Ouanaminthe, Haiti, 2,378
Ouargla, Algeria, 7,631
Oudtshoorn, C. of G. Hope, 22,186
Ouessant (island), France, 2,223
Ouezzane, Morocco, 27,068
Ouidah, Dahomey, 14,657
Oujda, Morocco, 130,544
Oullins, France, 17,728
Oulu (Uleåborg), Finland, 58,315
Oulu (lake), Finland
Oulu (river), Finland
Ounas (river), Finland
Ourinhos, Brazil, 25,717
Ouro Prêto, Brazil, 14,722
Ouse (river), England
Outjo, S.W. Africa, 2,943
Outlook, Saskatchewan, 1,340
Ovalle, Chile, 25,282
Ovamboland (region), S.W. Africa, 215,947
Ovar, Portugal, 7,298
Oviedo, Spain, †127,058
Owen Sound, Ontario, 17,421
Owyhee (river), U.S.
Oxbow, Saskatchewan, 1,359
Oxford, England, 106,124
Oxus (Amu-Dar'ya) (river), U.S.S.R.
Oyapock (river), S.A.
Oymyakon, U.S.S.R.
Oyo, Nigeria, 72,133
Oyonnax, France, 9,694
Oyster (bay), Tas., Australia
Ozark (mountains), U.S.
Ozd, Hungary, 34,155
Ozorków, Poland, 15,600

P

Paan (Batang), China
Paarl, C. of G. Hope, 38,059
Pabianice, Poland, 55,000
Pabna, Pakistan, 31,924
Pacasmayo, Peru, 11,890
Pachino, Italy, 24,830
Pachuca, Mexico, 64,564
Padang, Indonesia, 121,724
Padangsidempuan, Indonesia, †71,704
Paderborn, Germany, 53,984
Padre (island), Texas
Padua, Italy, 149,581
Pago Pago,* Amer. Samoa, 1,586
Pahlevi (Enzeli), Iran, 31,349
Paignton, England, 30,289
Pailin, Cambodia
Paisley, Scotland, 95,753
Paita, Peru, 33,076
Pająkumbuh, Indon., †74,393
Pakanbaru, Indonesia
Pakch'on, N. Korea, 17,184
Pakhoi, China, 75,000
Paknam (Samut Prakan), Thailand, 11,633
Pakokku, Burma, 23,558
Pakse, Laos, 130,060
Palamcottah, India, 30,967
Palana, U.S.S.R.
Palanpur, India, 21,643
Palapye, Bech. Pr., 1,042
Palau (islands), Pacific, 6,596
Palaw, Burma
Palawan (isl.), Phil. Is., 54,807
Palazzolo Acreide, Italy, 12,078
Paldiski, U.S.S.R., 851
Paleleh, Indonesia, 5,466
Palembang Indonesia, 321,248
Palencia, Spain, †48,216
Palermo, Italy, 501,005
Paletwa, Burma
Palghat, India, 55,160
Pali, India, 12,356
Palimé, Togo, 12,918
Palk (strait), Asia
Palma, Bal. Is., Spain, †159,084
Palma del Río, Spain, 12,323
Palma di Montechiaro, Italy, 18,569
Palma Soriano, Cuba, 15,743
Palmas (cape), Liberia
Palmas, Las,* Canary Islands, Spain, †193,862
Palmerston North, N.Z., †43,185
Palmi, Italy, 15,786
Palmira, Colombia, 24,881
Palmyra (island), Pacific, 32
Palni, India, 24,706
Palopo, Indonesia, 4,208
Palu, Indonesia
Pamangkat, Indonesia, †51,871
Pamekasan, Indonesia, †42,650
Pameungpeuk, Indonesia, †24,662
Pamiers, France, 9,641
Pamir (plateau), U.S.S.R.
Pamlico (sound), N.C.
Pamplona, Colombia, 16,396
Pamplona, Spain, †97,880
Panagyurishte, Bulg., 12,015
Panamá,* Panama, 273,440
Panamá (gulf), Panama
Panay (isl.), Phil. Is., 1,423,836
Pančevo, Yugoslavia, 40,740
Panciu, Rumania, 7,679
Pandeglang, Indonesia, †24,823
Pandharpur, India, 33,329
Panevežys (Panevezhis), U.S.S.R., 23,947
Panfilov, U.S.S.R., 11,148
Pangani, Tang., 3,000
Pangani (river), Tang.
Pangim, India, 31,950
Pangkalanbrandan, Indonesia, †23,806
Pangkalanbuun, Indonesia
Pangkalpinang, Indonesia, 43,322
Panihati, India, 27,410
Panipat, India, 37,837
Pankow, Germany, 143,962
P'anmunjŏm, Korea
Panna, India, 13,375
Panruti, India, 16,429
Pantelleria (isl.), Italy, 10,306
Pantin, France, 35,969
Paoki, China, 130,100
Paoting, China, 197,000
Paotow, China, 149,400
Pap, U.S.S.R., 3,049
Pápa, Hungary, 25,629
Papa Stour (island), Scotland, 68
Papa Westray (island), Scotland, 184
Papantla, Mexico, 18,579
Papeete,* Fr. Polynesia, 17,288
Papenburg, Germany, 15,037
Paphos, Cyprus, 9,083
Papua (gulf), Pacific
Papun, Burma
Pará (Belém), Brazil, 359,988
Paracatu, Brazil, 10,677
Paraćin, Yugoslavia, 11,590
Paradis, Quebec, 200

Paraguai (river), Brazil
Paraguari, Para, 5,040
Paraguay (river)
Paraíba (João Pessoa), Brazil, 89,517
Parakou Dahomey, 5,061
Paramaribo,* Surinam, 113,478
Paramushir (island), U.S.S.R.
Paraná, Argentina, 84,153
Paranã, Brazil, 594
Paraná (river), Argentina
Paranaguá, Brazil, 27,728
Paraníba (river), Brazil
Paranapanema (river), Brazil
Paratinga, Brazil, 2,403
Parbhani, India, 21,683
Parchim, Germany, 19,948
Pardes Hanna, Israel, 7,073
Pardo (river), Brazil
Pardubice, Czech., 52,655
Pare, Indonesia, †85,528
Parent, Quebec, 1,298
Parepare, Indonesia, †58,514
Pargolovo, U.S.S.R., 4,187
Paria (gulf), S.A.
Pariaman, Indonesia, †45,812
Parintins, Brazil, 9,068
Paris,* France, 2,820,534
Parkent, U.S.S.R., 7,722
Parkes, Australia, 8,223
Parlakimedi, India, 21,042
Parma, Italy, 95,227
Parnaíba, Brazil, 39,951
Parnaíba (river), Brazil
Parnassus (mountain), Greece
Pärnu (Pyarnu), U.S.S.R., 20,334
Parral, Chile, 12,973
Parral, Mexico, 41,461
Parramatta, Australia, 104,061
Parras, Mexico, 19,499
Parrsboro, N.S., 1,834
Parry Sound, Ontario, 6,004
Partanna, Italy, 13,706
Partapgarh, India, 13,505
Partinico, Italy, 24,000
Parvatipuram, India, 19,456
Pasadena, Calif., 116,407
Pasaje, Ecuador, 4,864
Pasangkaju, Indonesia
Paşcani, Rumania, 15,008
Pasewalk, Germany, 10,977
Pasinler, Turkey, 8,023
Paso de los Libres, Arg., 11,665
Paso de los Toros, Uruguay, 10,624
Paspébiac, Quebec, 800
Passau, Germany, 31,791
Passo Fundo, Brazil, 47,299
Passos, Brazil, 28,555
Pasto, Colombia, 110,790
Pasuruan, Indonesia, 56,293
Patan, India, 39,549
Patchewollock, Australia, 326
Paternion, Austria, 5,602
Paterno, Italy, 34,026
Paterson, N. J., 143,663
Pathfinder (res.), Wyo.
Pati, Indonesia, †56,749
Patiala, India, 124,948
Patjitan, Indonesia, †44,383
Patna, India, 362,817
Patos (lake), Brazil
Patras (Pátrai), Greece, 95,364
Patrocínio, Brazil, 13,933
Pattani, Thailand, 8,969
Pátzcuaro, Mexico, 14,281
Pau, France, 41,730
Paulis, R.o.t. Congo, 15,054
Paulistana, Brazil, 1,105
Pavda, U.S.S.R., 1,695
Pavia, Italy, 59,487
Pavlodar, U.S.S.R., 90,000
Pavlovsk, U.S.S.R., 20,844
Pavlovskaya Sloboda, U.S.S.R., 2,399
Pavlovskiy Posad, U.S.S.R., 55,000
Payne (lake), Quebec
Paysandú, Uruguay, 47,875
Paytok, U.S.S.R., 4,993
Pazardzhik, Bulgaria, 30,430
Peace (river), Alta.
Peace River, Alberta, 2,543
Pearl Harbor (bay), Hawaii
Peć, Yugoslavia, 21,058
Pechenga, U.S.S.R., 5,198
Pechora (river), U.S.S.R.
Pecos (river), U.S.
Pécs, Hungary, 114,713
Pedro Afonso, Brazil, 1,723
Peebinga, Australia, 68
Peebles, Scotland, 5,545
Peel (river), Canada
Peera Peera (lake), Australia
Pegu, Burma, 21,712
Pegu Yoma (mountains), Burma
Pehpei, China, 150,000
Pehuajo, Argentina, 13,537
Peine, Germany, 29,836
Peiping (Peking),* China, 2,768,149
Peipus (lake), U.S.S.R.
Peixe, Brazil, 557
Pekalongan, Indonesia, 94,904
Peking,* China, 2,768,149
Pelalawan, Indonesia
Peleliu (island), Palau Is., 846
Pelly, Saskatchewan, 476
Pelly (lake), N.W. Terrs.
Pelly (river), Yukon
Pelotas, Brazil, 121,280
Pemalang, Indonesia, †93,608
Pematangsiantar, Indonesia, 67,000
Pemba (isl.), Zanzibar, 133,858
Pemberton, British Columbia, 181
Pembroke, Ontario, 16,791
Pembroke, Wales, 12,737
Penang (George Town), Malaya, 234,930
Peñarroya-Pueblonuevo, Spain, 19,572
Penarth, Wales, 18,528
Penas (gulf), Chile
Pend Oreille (lake), Idaho
Pendembu, S. Leone, 2,203
Penedo, Brazil, 17,084
Pengpu, China, 253,000
Peniche, Portugal, 10,057
Penki, China, 449,000
Pennine (mt. range), Eng.
Penong, Australia, 212
Penrhyn (Tongareva) (island), Cook Is., 654
Penrith, Australia, †31,969
Penticton, Br. Columbia, 13,859
Pentland (channel), Scotland
Penza, U.S.S.R., 254,000
Penzance, England, 19,433
Peoria, Ill., 103,162
Pera (Beyoğlu), Turkey, 214,362
Pera Head (cape), Australia
Percé, Quebec, 1,642
Perdido (mt.), Spain
Perdue, Saskatchewan, 436
Pereira, Colombia, 30,762
Pergamino, Argentina, 32,382
Péribonca (river), Quebec
Périgueux, France, 37,168
Perleberg, Germany, 13,701
Perm, U.S.S.R., 628,000
Pernambuco (Recife), Brazil, 788,569
Pernik (Dimitrovo), Bulgaria, 59,721
Peron (islands), Australia
Perovo, U.S.S.R., 143,000
Perpignan, France, 63,863
Persian (gulf), Asia
Perth, Australia, †420,133
Perth, Ontario, 5,360
Perth, Scotland, 41,199
Perugia, Italy, 40,039
Pervomaysk, U.S.S.R., 10,028
Pervoural'sk, U.S.S.R., 90,000
Pesaro, Italy, 34,647
Pescadores (Penghu) (isls.), China
Pescara, Italy, 49,721
Peshawar, Pakistan, 213,000
Peshtera, Bulgaria, 8,946
Pessac, France, 14,969
Petah Tiqva, Israel, 52,771
Peterborough, Australia, 3,430
Peterborough, England, 62,031
Peterborough, Ontario, 47,185
Peterhead, Scotland, 12,497
Pétionville, Haiti, 9,417
Petit-Goâve, Haiti, 5,847
Petitcodiac, New Brunswick, 905
Petite-Rivière-de-l'Artibonite, Haiti, 4,377
Petrich, Bulgaria, 13,456
Petrinja, Yugoslavia, 5,461
Petrodvorets, U.S.S.R., 28,000
Petrokrepost', U.S.S.R., 6,412
Petrolina, Brazil, 7,478
Petropavlovsk, U.S.S.R., 131,000
Petropavlovsk-Kamchatskiy, U.S.S.R., 86,000
Petrópolis, Brazil, 93,849
Petroşani, Rumania, 23,052
Petrovsk-Zabaykal'skiy, U.S.S.R., 12,100
Petrovskoye, U.S.S.R., 14,732
Petrozavodsk, U.S.S.R., 135,000
Petsamo (Pechenga), U.S.S.R., 5,198
Pforzheim, Germany, 82,524

* designates capitals

† designates inclusion of suburbs

Phalodi, India, 17,689
Phan Rang, S. Vietnam, 15,761
Phan Ri, S. Vietnam
Phan Thiet, S. Vietnam
Phatthalung, Thailand, 5,180
Phet Buri, Thailand, 16,279
Philadelphia, Pa., 2,002,512
Philiatrá, Greece, 6,753
Philippeville, Algeria, 48,773
Philippine (islands), 27,455,799
Philippine (sea)
Phitsanulok, Thailand, 14,494
Phlórina, Greece, 11,933
Phnom Penh,* Cambodia, 420,000
Phoenix,* Ariz., 439,170
Phoenix (islands), Pacific, 984
Phong Saly, Laos
Phrae, Thailand, 11,900
Phu Ly, N. Vietnam
Phu Tho, N. Vietnam
Phuc Yen, N. Vietnam
Phuket, Thailand, 18,759
Piacenza, Italy, 60,114
Piatra Neamţ, Rumania, 32,648
Piazza Armerina, Italy, 25,558
Picos, Brazil, 8,176
Picton, Australia, 1,314
Picton, New Zealand, 2,315
Picton, Ontario, 4,998
Pictou, Nova Scotia, 4,534
Pidurutalagala (mt.), Ceylon
Piedras Negras, Mexico, 42,649
Piekary Śląskie, Poland, 30,400
Pielinen (lake), Finland
Pierre,* S. Dak., 10,088
Piešt'any, Czech., 18,669
Pietarsaari (Jakobstad), Finland, 14,718
Pietermaritzburg,* Natal, †95,124
Pietersburg, Transvaal, 27,835
Pikes Peak (mountain), Colo.
Pikwitonei, Manitoba, 175
Piła (Schneidemühl), Poland, 31,800
Pilar, Para., 7,136
Pilcomayo (river), S.A.
Pilibhit, India, 44,709
Pillar (cape), Tas., Australia
Pilsen (Plzeň), Czech., 137,763
Pimental, Peru, 5,966
Pinar del Río, Cuba, 38,885
Pincher Creek, Alberta, 2,961
Pindigheb, Pakistan, 10,150
Pindus (mt. range), Greece
Pine Creek, Australia, 109
Pine Falls, Manitoba, 1,103
Pinega, U.S.S.R., 1,376
Pinega (river), U.S.S.R.
Pinerolo, Italy, 20,856
Pines (island), Cuba, 10,105
Pingliang, China, 75,000
Pingrup, Australia, 176
Pinjarra, Australia, 956
Pinnaroo, Australia, 904
Pinneberg, Germany, 28,382
Pinsk, U.S.S.R., 31,913
Piombino, Italy, 28,122
Pionki, Poland, 10,100
Piotrków Tribunalski, Poland, 51,700
Piracicaba, Brazil, 80,670
Piraeus, Greece, 183,877
Pirapora, Brazil, 13,772
Pirenópolis, Brazil, 2,220
Pirmasens, Germany, 53,164
Pirna, Germany, 37,426
Pirogovskiy, U.S.S.R., 4,200
Pirot, Yugoslavia, 13,175
Pirovskoye, U.S.S.R., 1,443
Piru, Indonesia, †23,633
Pisa, Italy, 62,310
Pisco, Peru, 22,192
Písek, Czech., 19,542
Pisticci, Italy, 13,147
Pistoia, Italy, 33,526
Pitcairn (island), Pacific, 138
Piteşti, Rumania, 38,330
Pittsburgh, Pa., 604,332
Piura, Peru, 39,765
Placentia, Newfoundland, 1,610
Placetas, Cuba, 19,693
Plasencia, Spain, 14,224
Plastun, U.S.S.R., 1,500
Platte (river), Nebr.
Plauen, Germany, 84,778
Plav, Yugoslavia, 2,018
Plei Ku, S. Vietnam
Pleniţa, Rumania, 6,735
Pleszew, Poland, 10,800
Pletipi (lake), Quebec
Pleven, Bulgaria, 57,758
Plock, Poland, 41,300
Ploeşti, Rumania, 114,544
Plovdiv, Bulgaria, 162,518
Plymouth, England, 204,279
Plymouth,* Montserrat, 1,454
Plynlimmon (mountain), Wales
Plzeň, Czech., 137,763
Po (river), Italy
Pobeda (mountain)
Poços de Caldas, Brazil, 32,291
Podgorica (Titograd), Yugo., 16,324
Podkamennaya Tunguska, U.S.S.R.
Podol'sk, U.S.S.R., 124,000
Podor, Senegal, 3,996
P'ohang-dong, S. Korea, 59,555
Pointe-à-Pitre, Guadeloupe, 26,160
Pointe-Noire, R.o. Congo, 29,818
Poitiers, France, 45,805
Pola (Pula), Yugo., 36,838
Polatli, Turkey, 20,319
Polgár, Hungary, 9,344
Polotsk, U.S.S.R., 24,816
Polovinnoye, U.S.S.R., 2,551
Poltava, U.S.S.R., 141,000
Polyanovgrad, Bulgaria, 10,225
Polynesia (islands), Pacific
Pomona, Calif., 67,157
Pomona (island), Scotland, 13,508
Ponape (island), Caroline Is., 6,316
Ponce, Puerto Rico, 114,286
Pondicherry, India, 59,835
Ponnani, India, 17,838
Ponoka, Alberta, 3,938
Ponorogo, Indonesia, 49,993
Ponoy, U.S.S.R., 291
Pont-à-Mousson, France, 9,899
Pont-l'Evêque, France, 1,967
Ponta Grossa, Brazil, 77,803
Ponta Porã, Brazil, 9,610
Pontarlier, France, 12,130
Pontecorvo, Italy, 13,100
Pontefract, England, 23,173
Ponteix, Saskatchewan, 887
Pontevedra, Spain, †50,483
Pontiac, Mich., 82,233
Pontianak, Indonesia, 154,000
Pontine (islands), Italy, 4,483
Pontivy, France, 6,764
Pontoise, France, 9,658
Pontypool, England, 39,879
Pontypridd, Wales, 35,536
Poole, England, 88,088
Poona, India, 721,134
Poopó (lake), Bolivia
Popayán, Colombia, 57,770
Porbandar, India, 48,493
Porcuna, Spain, 12,755
Porcupine (river), Yukon
Porcupine Plain, Sask., 472
Pordenone, Italy, 23,625
Poreč, Yugoslavia, 2,488
Pori (Björneborg), Finland, 54,024
Poronaysk, U.S.S.R., 27,935
Porsanger (fjord), Norway
Porsgrunn, Norway, 10,720
Port Adelaide, Australia, 38,923
Port Alberni, Br. Columbia, 11,560
Port Albert, Australia, 333
Port-Alfred, Quebec, 9,066
Port Alice, Br. Columbia, 1,073
Port-à-Piment, Haiti, 2,328
Port Arthur (incl. in Lüta), China, 126,000
Port Arthur, Ontario, 45,276
Port Arthur, Tex., 66,676
Port Augusta, Australia, 9,711
Port-au-Prince,* Haiti, 151,220
Port-aux-Basques-Channel, Newfoundland, 4,141
Port-Cartier, Quebec, 3,458
Port Colborne, Ontario, 14,886
Port-de-Paix, Haiti, 6,964
Port Elizabeth, C. of G. Hope, †270,815
Port-Étienne (Nuadibu), Mauritania, 1,500
Port Fairy, Australia, 2,426
Port Francqui, R.o.t. Congo, 3,607.
Port-Gentil, Gabon, 20,724
Port Glasgow, Scotland, 22,551
Port Harcourt, Nigeria, 71,634
Port Hardy, B.C., 468
Port Hawkesbury, N.S., 1,346
Port Hedland, Australia, 965
Port Hood, Nova Scotia, 472
Port Hope, Ontario, 8,091
Port Laoighise (Maryborough), Ireland, 3,133
Port Lincoln, Australia, 7,508
Port Louis,* Mauritius, 97,888
Port-Lyautey (Kenitra), Morocco, 88,533

Port Macquarie, Australia, 5,952
Port Melbourne, Aust., 12,370
Port-Menier, Anticosti Island, Quebec, 438
Port Moresby,* Papua, 17,546
Port Nolloth, C. of G. Hope, 2,592
Port of Spain,* Trinidad and Tobago, 93,954
Port Phillip (bay), Australia
Port Pirie, Australia, 14,003
Port Radium, N.W. Terrs., 412
Port Said, Egypt, 241,300
Port Saunders, Newf., 504
Port Shepstone, Natal, 4,238
Port Simpson, Br. Columbia, 750
Port Sudan, Sudan, 53,800
Port Talbot, Wales, 50,223
Port Wakefield, Australia, 490
Port Wallut, N. Vietnam
Portadown, N. Ireland, 18,605
Portage la Prairie, Man., 12,388
Portalegre, Portugal, 10,510
Portarlington, Australia, 1,003
Portimão, Portugal, 12,066
Portland, Australia, 6,014
Portland, Maine, 72,566
Portland, Oreg., 372,676
Portland Bill (prom.), England
Pôrto (Oporto), Portugal, 310,474
Pôrto Alegre, Brazil, 617,629
Porto Alexandre, Angola, 2,894
Porto Amboim, Angola, 1,537
Porto Amélia, Moz., 5,095
Porto Civitanova (Civitanova Marche), Italy, 23,625
Porto Empedocle, Italy, 15,632
Pôrto Murtinho, Brazil, 4,476
Pôrto Nacional, Brazil, 2,953
Porto-Novo,* Dahomey, 31,000
Porto Novo, India, 14,175
Porto Tolle, Italy, 19,403
Pôrto Velho, Brazil, 19,387
Portoviejo, Ecuador, †28,460
Portsmouth, England, 215,198
Portsmouth, Va., 114,773
Poruba, Czech., 21,179
Posadas, Argentina, 37,588
Posen (Poznań), Poland, 407,800
Poso, Indonesia, 2,875
Possneck, Germany, 20,247
Potchefstroom, Transv., 41,701
Potenza, Italy, 22,371
Potgietersrus, Transvaal, 11,438
Ptoi, U.S.S.R., 16,671
Potosí, Bolivia, 54,374
Potsdam, Germany, 113,568
Pouce-Coupé, Br. Columbia, 669
Poudre d'Or, Maur., 1,504
Póvoa de Varzim, Port., 16,913
Powassan, Ontario, 1,064
Powder (river), U.S.
Powell River, Br. Col., 5,700
Poyang (lake), China
Poyarkovo, U.S.S.R., 2,617
Poza Rica, Mexico, 19,175
Požarevac, Yugoslavia, 18,529
Požega, Yugoslavia, 10,052
Poznań (Posen), Poland, 407,800
Pozoblanco, Spain, 14,066
Pozzallo, Italy, 11,645
Pozzuoli, Italy, 35,216

Prague (Praha),* Czech., 1,003,341
Prainha, Brazil, 778
Prapat, Indonesia, 5,532
Prato, Italy, 44,626
Prawle (point), England
Preeceville, Saskatchewan, 924
Preetz, Germany, 12,769
Prelate, Saskatchewan, 618
Premier, Br. Columbia, 400
Prenzlau, Germany, 17,699
Přerov, Czechoslovakia, 30,511
Prescott, Ontario, 5,366
Presidente Epitacio, Brazil, 10,425
Presidente Prudente, Brazil, 54,055
Presidente Roque Sáenz Peña, Argentina, 23,100
Prešov, Czechoslovakia, 35,121
Pressburg (Bratislava), Czech., 242,091
Preston, England, 113,208
Prestwick, Scotland, 12,564
Pretoria,* S. Afr., †415,989
Préveza, Greece, 11,172
Prey Veng, Cambodia, 8,696
Pribilof (islands), Alaska
Príbram, Czech., 25,729
Priego de Córdoba, Spain, 12,276
Prieska, C. of G. Hope, 6,464
Prijedor, Yugoslavia, 10,464
Prikumsk, U.S.S.R., 15,776
Prilep, Yugoslavia, 37,486
Primorsk, U.S.S.R.
Prince Albert, C. of G. Hope, 2,152
Prince Albert, Sask., 24,168
Prince Albert (park), Sask., 109
Prince Edward (island), Canada, 104,629
Prince George, Br. Columbia, 13,877
Prince Rupert, Br. Columbia, 11,987
Prince of Wales (island), Australia
Prince of Wales (island), N.W. Terrs.
Princess Charlotte (bay), Australia
Princeton, Br. Columbia, 2,163
Príncipe (island), S. Tomé and Príncipe, 4,574
Priozersk, U.S.S.R., 4,132
Pripet (Pripyat')(river), U.S.S.R.
Priština, Yugoslavia, 40,071
Priverno, Italy, 9,154
Prizren, Yugoslavia, 22,997
Probolinggo, Indonesia, 64,716
Proddatur, India, 26,961
Progreso, Mexico, 13,659
Prokop'yevsk, U.S.S.R., 282,000
Prokuplje, Yugoslavia, 10,050
Prome, Burma, 36,762
Propriá, Brazil, 15,947
Proserpine, Australia, 2,523
Prostějov, Czechoslovakia, 33,519
Provadiya, Bulgaria, 8,730
Providence,* R.I., 207,498
Provideniya, U.S.S.R.

Provost, Alberta, 1,022
Prudnik, Poland, 14,400
Pruszków, Poland, 37,300
Prut (river), Europe
Przemyśl, Poland, 44,660
Przeworsk, Poland, 8,569
Przheval'sk, U.S.S.R., 21,173
Pskent, U.S.S.R., 7,218
Pskov, U.S.S.R., 81,000
Pszczyna, Poland, 14,500
Ptuj, Yugoslavia, 4,735
Pucallpa, Peru, 2,368
Pucioasa, Rumania, 9,259
Pudukkottai, India, 34,188
Puebla, Mexico, 287,952
Pueblo, Colo., 91,181
Puente-Genil, Spain, 22,699
Puerto Armuelles, Panama, 10,712
Puerto Ayacucho, Ven., †5,462
Puerto Barrios, Guatemala, 15,155
Puerto Berrio, Colombia, 5,487
Puerto Cabello, Venezuela, 52,222
Puerto Carreño, Colombia, 540
Puerto Colombia, Colombia, 4,896
Puerto Cortés, Honduras, 17,412
Puerto Cumarebo, Ven., 8,033
Puerto Deseado, Arg., 3,392
Puerto Eten, Peru, 2,191
Puerto Madryn, Arg., 3,441
Puerto Maldonado, Peru, 3,536
Peurto México (Coatzacoalcos), Mexico, 36,989
Puerto Montt, Chile, 41,681
Puerto Plata, Dominican Rep., 19,073
Puerto Princesa, Phil. Is., 23,154
Puerto Real, Spain, 12,726
Puerto Rico (island), 2,349,544
Puerto Wilches, Colombia, 2,055
Puertollano, Spain, 29,468
Pugachev, U.S.S.R., 17,411
Puget (sound), Wash.
Pukch'ŏng, N. Korea, 30,709
Pukekohe, New Zealand, 3,798
Pula (Pola), Yugoslavia, 36,838
Pulacayo, Bolivia, 7,984
Puławy, Poland, 13,400
Pułtusk, Poland, 10,400
Punakha,* Bhutan
Punch, India, 8,608
Puno, Peru, 25,145
Punta Alta, Argentina, 19,852
Punta Arenas, Chile, 46,737
Puntarenas, Costa Rica, 19,145
Purbolinggo, Indonesia, 31,719
Puri, India, 41,055
Puruándiro, Mexico, 11,478
Purnea, India, 19,036
Puruktjau, Indonesia
Purulia, India, 30,445
Purus (river), Brazil
Purwakarta, Indonesia, †88,680
Purwodadi, Indonesia, †54,648
Purwokerto, Indonesia, 22,623
Purworedjo, Indonesia, 23,209
Pusan, S. Korea, 1,162,614
Pushkin, U.S.S.R., 45,700
Pushkino, U.S.S.R.
Püspökladány, Hungary, 15,735
Puteaux, France, 37,233
Putignano, Italy, 14,721

Puttur, India, 9,563
Putumayo (river), S.A.
Putussibau, Indonesia, †8,357
Pyapon, Burma, 15,501
Pyarnu (Pärnu), U.S.S.R., 20,334
Pyatigorsk, U.S.S.R., 69,000
Pyinmana, Burma
P'yŏngyang (Heijo),* N. Korea, 653,100
Pyramid (lake), Nev.
Pyrenees (mt. range), Europe
Pýrgos, Greece, 20,558
Pyrmont, Germany, 16,264
Pyskowice, Poland, 20,400
Pytalovo, U.S.S.R., 1,242

Q

Qattara (depression), Egypt
Qena, Egypt, 55,260
Qiryat Bialik, Israel, 9,580
Qiryat Haiyim, Israel, 10,000
Qiryat Motzkin, Israel, 8,889
Qiryat Shemona, Israel, 11,818
Qiryat Yam, Israel, 10,174
Qizan, Saudi Arabia, 5,000
Qu'Appelle (river), Canada
Quang Nam, S. Vietnam
Quang Ngai, S. Vietnam, 11,806
Quang Tri, S. Vietnam, 14,077
Quang Yen, N. Vietnam
Quartu Sant' Elena, Italy, 17,324
Quchan, Iran, 21,250
Québec,* Quebec, 171,979
Québec, Greater, Quebec, 357,568
Quedlinburg, Germany, 35,142
Queen Charlotte (islands), B.C., 3,082
Queen Charlotte (sound), B.C.
Queen Maud (gulf), N.W. Terrs.
Queenstown, Australia 4,601
Queenstown, C. of G. Hope, 33,126
Queenstown (Cobh), Ireland, 5,266
Quelimane, Mozambique, 4,451
Quequén, Argentina, 4,627
Querétaro, Mexico, 67,277
Quesnel, Br. Columbia, 4,673
Quetta, Pakistan, 107,000
Quezaltenango, Guat., 27,672
Quezon City,* Phil. Is., 397,374
Qui Nhon, S. Vietnam
Quibdó, Colombia, 41,350
Quillacollo, Bolivia, 9,123
Quillota, Chile, 29,447
Quilpie, Australia, 860
Quimili, Argentina, 3,686
Quimper, France, 15,629
Quirindi, Australia, 2,790
Quito,* Ecuador, †390,400
Qum, Iran, 96,499
Qunfidha, Saudi Ar., 4,500
Quorn, Australia, 566
Qurveh, Iran, 4,636

R

Ra'anana, Israel, 10,656
Raba, Indonesia, 6,781
Rabat,* Morocco, 238,453
Rabaul, Terr. New Guinea, 7,600
Rača, Yugoslavia, 1,315
Race (cape), Newf.
Rach Gia, S. Vietnam, 20,160
Racibórz (Ratibor), Poland, 28,900
Racine, Wis., 89,144
Rădăuţi, Rumania, 15,949
Radevormwald, Germany, 18,067
Radhanpur, India, 11,959
Radium Hot Springs, B.C., 75
Radom, Poland, 130,100
Radomsko, Poland, 26,200
Radville, Sask., 1,067
Rae, N.W. Terrs., 100
Rae (isthmus), N.W. Terrs.
Rafaela, Argentina, 23,665
Ragusa, Italy, 42,429
Ragusa (Dubrovnik), Yugo., 19,172
Rahaeng (Tak), Thailand, 8,246
Rahimyar Khan, Pakistan, 14,919
Raichur, India, 53,858
Raigarh, India, 20,327
Rainier (mountain), Wash.
Rainy (lake), U.S.-Canada
Rainy (river), U.S.-Canada
Rainy River, Ontario, 1,168
Raipur, India, 139,983
Rajahmundry, India, 130,030
Rajapalaiyam, India, 46,289
Rajkot, India, 194,510
Rajnandgaon, India, 19,039
Rajpipla, India, 15,855
Rajshahi, Pakistan, 39,662
Rákospalota, Hungary, 48,379
Raleigh,* N.C., 93,931
Ram Hormuz, Iran, 7,854
Ramadi, Iraq, 85,873
Ramallah, Jordan, 16,315
Ramat Gan, Israel, 90,234
Ramat Hasharon, Israel, 10,418
Rambipudji, Indonesia, †45,521
Ramenskoye, U.S.S.R., 20,100
Ramle, Israel, 22,444
Ramnad, India, 18,152
Râmnicu Sărat, Rumania, 19,095
Râmnicu Vâlcea, Rumania, 18,984
Ramoutsa, Bech. Pr., 8,256
Rampur, India, 135,566
Ramsgate, England, 36,906
Ranan (Nanam), N. Korea, 20,936
Rancagua, Chile, 53,318
Ranchi, India, 139,437
Randers, Denmark, 42,238
Randwick, Australia, 108,814
Rangiora, New Zealand, 3,540
Rangkasbitung, Indonesia, †51,176
Rangoon,* Burma, 711,520
Rangpur, Pakistan, 30,501
Rankovićevo, Yugoslavia, 15,152
Rannes, Australia, 65
Rannoch (lake), Scotland
Rapa Nui (Easter) (island), Chile, 270
Rarotonga (isl.), Cook Is., 5,828
Rastatt, Germany, 24,067
Rastede, Germany, 14,234
Rat Buri, Thailand, 9,173
Ratangarh, India, 20,961
Rathenow, Germany, 27,566
Rathlin (island), N. Ireland
Ratibor (Racibórz), Poland, 28,900
Ratingen, Germany, 36,020
Ratlam, India, 44,939
Ratnagiri, India, 17,904
Ratnapura, Ceylon, 12,367
Ratzeburg, Germany, 11,359
Rauma (Raumo), Finland, 21,685
Ravenna, Italy, 34,904
Ravensburg, Germany, 31,269
Ravenshoe, Australia, 1,086
Ravensthorpe, Australia, 509
Rawalpindi,* Pakistan, 343,000
Rawicz, Poland, 12,300
Rawmarsh, England, 19,603
Rawson (Chubut), Arg., 1,745
Ray (cape), Newf.
Raymond, Alberta, 2,362
Razgrad, Bulgaria, 15,023
Ré (island), France, 7,908
Reading, England, 119,870
Reading, Pa., 98,177
Real (mt. range), S.A.
Reboly, U.S.S.R., 168
Rebrikha, U.S.S.R., 5,554
Recherche (arch.), Australia
Rechitsa, U.S.S.R., 16,559

Recife (Pernambuco), Brazil, 512,370
Recklinghausen, Germany, 130,581
Reconquista, Argentina, 12,729
Red (lake), Minn.
Red (river), U.S.
Red (river), U.S.
Red (sea)
Red Deer, Alberta, 19,612
Red Deer (river), Alberta
Red Lake, Ontario, 1,667
Red Rock, Ontario, 1,861
Red Volta (river), Upper Volta
Redcar, England, 31,460
Redcliff, Alberta, 2,221
Redditch, England, 34,077
Redruth, England, 26,090
Ree (lake), Ireland
Regensburg, Germany, 125,047
Reggan, Algeria, 508
Reggio di Calabria, Italy, 120,021
Reggio nell'Emilia, Italy, 65,360
Reghin, Rumania, 18,091
Regina,* Saskatchewan, 112,141
Rehoboth, S.W. Africa, 2,954
Rehovot, Israel, 28,740
Reichenbach, Germany, 34,708
Reichenbach (Dzierżoniów), Poland, 24,100
Reichenberg (Liberec), Czech., 65,267
Reigate, England, 53,710
Reims, France, 114,682
Reina Adelaida (arch.), Chile
Reindeer (lake), Canada
Reinosa, Mexico, 74,113
Remanso, Brazil, 5,125
Rembang, Indonesia, 39,939
Remedios, Cuba, 10,602
Remiremont, France, 8,562
Remscheid, Germany, 126,892
Renaix (Ronse), Belg., 25,094
Rendsburg, Germany, 35,721
Renfrew, Ontario, 8,935
Renfrew, Scotland, 17,946
Rengat, Indonesia, †22,982
Renmark, Australia, †6,070
Rennes, France, 112,553
Reo, Indonesia
Republican (river), U.S.
Resht, Iran, 109,491
Resistencia, Argentina, 52,385
Reşiţa, Rumania, 41,234
Resolution (island), N.W. Terrs.
Retalhuleu, Guatemala, 9,304
Réthymnon, Greece, 14,999
Réunion (island), 274,370
Reus, Spain, 31,739
Reutlingen, Germany, 67,407
Revda, U.S.S.R., 55,000
Revelstoke, Br. Columbia, 3,624
Revillagigedo (islands), Mexico
Rewa, India, 26,008
Rewari, India, 30,673
Reyhanli, Turkey, 12,305
Reykjavík,* Iceland, 72,407
Reza'iyeh (Urmia), Iran, 67,605
Rēzekne, U.S.S.R., 13,139
Rheden, Netherlands, 8,475
Rheine, Germany, 44,322
Rheinhausen, Germany, 68,126
Rheydt, Germany, 94,004
Rhine (river), Europe
Rho, Italy, 22,137
Rhodes, Greece, 27,393
Rhodes (Ródos) (island), Greece, 63,951
Rhodope (mountains), Bulgaria
Rhondda, Wales, 100,314
Rhône (river)
Rhyl, Wales, 18,745
Ribe, Denmark, 7,809
Ribble (river), England
Ribeirão Prêto, Brazil, 116,153
Riberalta, Bolivia, 6,549
Richibucto, New Brunswick, 1,695
Richmond, Australia, 806
Richmond, Australia, 33,863
Richmond,* Va., 219,958
Riding Mountain (park), Man., 253
Ried im Innkreis, Austria, 9,375
Riehen, Switzerland, 18,077
Riesa, Germany, 34,406
Riesi, Italy, 19,976
Rieti, Italy, 17,865
Riga, U.S.S.R., 605,000
Riga (gulf), U.S.S.R.
Rigo, Papua
Riihimäki, Finland, 20,204
Rijeka, Yugoslavia, 100,339
Rijswijk, Neth., 4,484
Rimbey, Alberta, 1,266
Rimini, Italy, 50,123
Rimouski, Quebec, 17,739
Ringwood, Australia, 24,427
Río Blanco, Mexico, 11,907
Rio Branco, Brazil, 18,116
Río Caribe, Venezuela, 7,791
Río Cuarto, Argentina, 48,706
Rio de Janeiro, Brazil, 3,307,163
Río Gallegos, Argentina, 5,880
Rio Grande, Brazil, 83,189
Rio Grande (river), U.S.-Mex.
Rio Pardo, Brazil, 14,412
Rio Tinto, Brazil, 20,352
Río Verde, Mexico, 14,294
Riobamba, Ecuador, †43,860
Riohacha, Colombia, 5,651
Rionero in Vulture, Italy, 13,500
Riosucio, Colombia, 648
Ripley, England, 17,601
Risca, England, 14,008
Rishon le Zion, Israel, 27,998
Rive-de-Gier, France, 13,786
Rivera, Uruguay, 42,623
Riverhurst, Saskatchewan, 281
Rivers Inlet, Br. Columbia, 250
Riversdale, C. of G. Hope, 5,071
Riverside, Calif., 84,332
Riverton, Manitoba, 808
Rivière-Bleue, Quebec, 1,540
Rivière-du-Loup, Quebec, 10,854
Riyadh,* Saudi Arabia, 300,000
Rize, Turkey, 22,261
Roanne, France, 45,262
Roanoke, Va., 97,110
Robertsport, Liberia
Roberval, Quebec, 7,739
Robson (mountain), Canada
Roca (cape), Portugal
Rocha, Uruguay, 19,895
Rochdale, England, 85,785
Rochefort, France, 23,753
Rochester, England, 50,121
Rochester, N.Y., 318,611
Rockbank, Australia, 241
Rockdale, Australia, 79,115
Rockford, Ill., 126,706
Rockglen, Saskatchewan, 492
Rockhampton, Australia, 44,128
Rockingham, Australia, 1,301
Rocky (mountains), U.S.-Canada
Rocky Mountain House, Alberta, 2,360
Rodakovo, U.S.S.R., 1,469
Rodez, France, 17,136
Rodrigues (islands), Maur., 13,333
Roebourne, Australia, 397
Roebuck (bay), Australia
Roermond, Netherlands, 25,728
Roes Welcome (sound), N.W. Terrs.
Roeselare (Roulers), Belgium, 35,410
Rogaguado (lake), Bolivia
Rohri, Pakistan, 13,243
Roi Et, Thailand, 8,105
Rojas, Argentina, 6,608
Roma, Australia, 5,571
Romaine (river), Canada
Roman, Rumania, 27,948
Romans-sur-Isère, France, 18,865
Rome (Roma),* Italy, 1,610,467
Romilly-sur-Seine, France, 12,925
Ron, N. Vietnam
Rona (island), Scotland
Ronda, Spain, 17,131
Ronge (lake), Sask.
Rönne, Denmark, 13,195
Ronse (Renaix), Belgium, 25,094
Roosevelt (res.), Ariz.
Roosevelt (river), Brazil
Roosendaal, Netherlands, 33,984
Roper (river), Australia
Roques, Los (islands), Venez., 537
Roraima (mountain), S.A.
Rorschach, Switz., 12,759
Rosa (mountain), Europe
Rosario, Argentina, 467,937
Rosario, Mexico, 11,608
Rosario de la Frontera, Arg., 4,927
Rosário Oeste, Brazil, 2,607
Roscommon, Ireland, 1,697
Rose-Blanche, Newf., 627
Roseau,* Dominica, 10,422
Rosenheim, Germany, 31,611
Rosetown, Saskatchewan, 2,450
Rosignol, Br. Guiana, 1,204
Roşiorii de Vede, Rumania, 17,320
Roskilde, Denmark, 31,928
Roslavl', U.S.S.R., 28,974
Ross, New Zealand, 503
Ross River, Yukon, 30
Rossano, Italy, 12,948
Rossland, Br. Columbia, 4,354

** designates capitals*

† designates inclusion of suburbs

Rosslau, Germany, 17,473
Rossosh', U.S.S.R., 16,270
Rosthern, Saskatchewan, 1,264
Rostock, Germany, 149,301
Rostov, U.S.S.R., 597,000
Rothenburg, Germany, 11,134
Rotherham, England, 85,346
Rothesay, New Brunswick, 782
Rothesay, Scotland, 10,141
Roto, Australia, 158
Rotorua, New Zealand, †25,068
Rotterdam, Neth., 722,718
Rottweil, Germany, 17,885
Rotuma (island), Pacific, 2,929
Roubaix, France, 109,480
Rouen, France, 113,062
Rouleau, Saskatchewan, 436
Rousay (island), Scotland, 338
Rouyn, Quebec, 18,716
Rovaniemi, Finland, 21,505
Rovereto, Italy, 20,196
Rovigo, Italy, 17,588
Rovinj (Rovigno), Yugoslavia, 5,712
Rovno (Równe), U.S.S.R., 57,000
Rowsley, Australia, 125
Roxas, Phil. Is., 11,673
Roxburgh, New Zealand, 771
Royale (island), Mich.
Rtishchevo, U.S.S.R., 11,409
Rub' al Khali (desert), Saudi Arabia
Rubtsovsk., U.S.S.R., 111,000
Ruda, Poland, 131,300
Rudolf (lake), Kenya
Rudolstadt, Germany, 22,100
Rueil-Malmaison, France, 17,103
Rufiji (river), Tang.
Rufino, Argentina, 10,987
Rufisque, Senegal, 49,660
Rugby, England, 51,651
Rügen (island), Germany
Rugozero, U.S.S.R., 487
Rukwa (lake), Tang.
Rulhieres (cape), Australia
Rum (island), Scotland, 25
Ruma, Yugoslavia, 15,619
Rumia, Poland, 13,400
Rumoe, Japan, 35,818
Runanga, New Zealand, 1,735
Runcorn, England, 26,035
Rupert (river), Quebec
Rusape, S. Rhodesia, 1,134
Ruse, Bulgaria 83,472
Rushden, England, 17,370
Russell, Manitoba, 1,263
Rute, Spain, 13,387
Rutherglen, Scotland, 25,067
Ruvo di Puglia, Italy, 25,662
Ruvuma (river), Africa
Ruwenzori (mountain), Africa
Ružomberok, Czech., 18,555
Ryazan', U.S.S.R., 213,000
Ryazhsk, U.S.S.R., 20,000
Rybinsk, U.S.S.R., 181,000
Rybinsk (res.), U.S.S.R.
Rybnik, Poland, 32,000
Rychbach (Dzierżoniów), Poland, 26,200
Ryde, Australia, 75,568
Ryde, England, 19,796
Ryukyu (islands), 883,122
Rzeszów, Poland, 60,000
Rzhev, U.S.S.R., 45,000

S

's Gravenhage,* Neth., 606,728
's Hertogenbosch, Neth., 67,394
Sa'ada, Yemen, 4,000
Sá da Bandeira, Angola, 11,657
Saalfeld, Germany, 26,387
Saalfelden, Austria, 8,900
Saarbrücken, Germany, 130,705
Saarlautern, Germany, 36,807
Šabac, Yugoslavia, 30,231
Sabadell, Spain, 51,306
Sabang, Indonesia, 6,855
Sabang, Indonesia
Sabi (river), S. Rhodesia
Sabinas, Mexico, 15,953
Sabine (river), U.S.
Sabirabad, U.S.S.R., 2,480
Sable (cape), N.S.
Sable (island), N.S.
Sabya, Saudi Ar., 5,000
Sabzawar (Shindand), Afghan., 5,000
Sabzawar, Iran, 30,545
Sackville, New Brunswick, 3,038
Sacramento,* Calif., 191,667
Sacramento (river), Calif.
Sadec, S. Vietnam, 35,410
Safad, Israel, 10,586
Safi, Morocco, 82,506
Saga, Japan, 129,888
Sagaing, Burma, 13,631
Sagamihara, Japan, 83,841
Saginaw, Mich., 98,265
Sagua la Grande, Cuba, 26,187
Saguenay (river), Quebec
Saharanpur, India, 185,019
Sahuayo, Mexico, 21,673
Saïda, Algeria, 13,292
Saida (Sidon), Lebanon, 17,739
Saidabad, Iran, 12,160
Saidapet, India, 41,347
Saidor, Terr. N.G.
Saigon,* S. Vietnam, 1,794,360
Saihut, Aden Pr., 10,000
Saiki, Japan, 51,226
Saint Abbs Headland (prom.), Scotland
Saint Albans, England, 50,276
Saint Albans, Newf., 1,547
Saint-Amand-Montrond, France, 9,831
Saint Andrews, N.B., 1,531
Saint Annes, Eng., 36,222
Saint Anthony, Newf., 1,820
Saint-Augustin, Quebec, 372
Saint Austell, England, 25,027
Saint-Benoit, Réunion, 8,175
Saint Boniface, Man., 37,600
Saint Brandon (islands), Maur., 136
Saint Brides (bay), Wales
Saint-Brieuc, France, 32,965
Saint Catharines, Ontario, 84,472
Saint-Chamond, France, 14,546
Saint Christopher (St. Kitts), (isl.), West Indies, 38,291
Saint-Claude, France, 9,865
Saint-Cloud, France, 17,101
Saint Davids Headland (prom.), England
Saint-Denis, France, 79,611
Saint-Denis,* Réunion, 41,863
Saint-Dié, France, 18,033
Saint-Dizier, France, 22,542
Saint Elias (mt.), Can.-U.S.
Saint-Étienne, France, 154,283
Saint-Félicien, Quebec, 5,133
Saint George, Australia, 2,209
Saint George, N.B., 1,133
Saint George (mt. range), Aust.
Saint George's,* Grenada, 7,305
Saint Georges, Newf., 966
Saint Georges (channel)
Saint-Germain, France, 25,394
Saint-Gilles, Belgium, 55,175
Saint Helena (island), 4,748
Saint Helens, England, 108,348
Saint Helier (*Jersey), Channel Is., 26,484
Saint-Hyacinthe, Quebec, 22,354
Saint Ives (bay), England
Saint-Jean, Quebec, 26,988
Saint-Jean (lake), Quebec
Saint-Jean-de-Luz, France, 8,476.
Saint-Jean-Port-Joli, Quebec, 1,322
Saint-Jérôme, Quebec, 24,546
Saint John, N.B., 55,153
Saint John, Greater, N.B., 95,563
Saint John (river), N.B.
Saint Johns,* Antigua, 21,637
Saint John's,* Newf., 63,633
Saint Joseph, Mo., 79,673
Saint-Joseph, Quebec, 2,484
Saint-Joseph, Réunion, 5,508
Saint Joseph (lake), Ont.
Saint-Josse-ten-Noode, Belgium, 25,024
Saint-Junien, France, 8,103
Saint Kilda, Australia, 52,205
Saint Kilda (island), Scotland
Saint Kitts (St. Christopher) (island), W.I., 38,291
Saint-Laurent, Fr. Guiana, 2,095
Saint Lawrence, Australia, 290
Saint Lawrence, Newf., 2,095

* designates capitals

† designates inclusion of suburbs

Saint Lawrence (gulf), Canada
Saint Lawrence (isl.), Alaska
Saint Lawrence (river), Canada
Saint-Léonard, N.B., 1,666
Saint-Lô, France, 11,287
Saint Louis, Mo., 750,026
Saint-Louis, Réunion, 25,220
Saint-Louis, Senegal, 48,840
Saint Lucia (island), W.I., 86,194
Saint Magnus (bay), Scotland
Saint-Malo, France, 13,515
Saint-Malo (gulf), France
Saint-Mandé, France, 22,279
Saint-Marc, Haiti, 10,222
Saint Mary's, Australia, 719
Saint-Maur-des-Fossés, France, 55,079
Saint-Michel-de-l'Atalaye, Haiti, 2,328
Saint Moritz, Switz., 3,751
Saint-Nazaire, France, 33,513
Saint-Nicolas (Sint-Niklaas), Belgium, 46,474
Saint-Omer, France, 15,785
Saint-Ouen, France, 45,360
Saint-Pacôme, Quebec, 1,242
Saint-Pascal, Quebec, 2,144
Saint Paul, Alberta, 2,823
Saint Paul,* Minn., 313,411
Saint Peter Port (*Guernsey), Channel Is., 15,706
Saint Petersburg, Fla., 181,298
Saint-Pierre, Réunion, 27,573
Saint-Pierre,* St. P. and Miquelon, 4,822
Saint-Quentin, France, 52,148
Saint-Servan, France, 10,815
Saint-Siméon, Quebec, 1,197
Saint Stephen, N.B., 3,380
Saint Thomas, Ontario, 22,469
Saint Vincent (cape), Portugal
Saint Vincent (isl.), W.I., 80,005
Saint Walburg, Sask., 689
Sainte-Anne-de-Beaupré, Quebec, 1,878
Sainte-Marie, Quebec, 3,662
Sainte-Marie (cape), Malg. Rep.
Sainte Rose du Lac, Man., 790
Sainte-Savine, France, 9,874
Saintes, France, 21,154
Saipan (island), Mariana Is., 4,943
Sakai, Japan, 339,863
Sakarya (Adapazari), Turkey, 80,160
Sakata, Japan, 97,671
Sakhalin (island), U.S.S.R., 500,000
Sakhnin, Israel, 4,900
Sakishima (islands), Ryukyu Is., 123,781
Sakon Nakhon, Thailand, 5,975
Salado (river), Argentina
Salado (river), Argentina
Salaga, Ghana, 3,156
Salair, U.S.S.R., 21,500
Salamanca, Mexico, 32,192
Salamanca, Spain, †90,498
Salamat (river), Chad
Salamís, Greece, 11,161
Salatiga, Indonesia, 50,063
Salaverry, Peru, 4,514
Salazar, Angola, 2,105
Saldanha, C. of G. Hope, 2,195
Sale, Australia, 7,899
Salé, Morocco, 77,194
Salekhard, U.S.S.R., 8,800
Salem, India, 249,084
Salem,* Oreg., 49,142
Salemi, Italy, 13,755
Salerno, Italy, 72,626
Salgótarján, Hungary, 26,682
Salihli, Turkey, 24,114
Salina Cruz, Mexico, 14,881
Salinas, Ecuador, †10,780
Salisbury, Australia, 9,349
Salisbury, England, 35,471
Salisbury (plain), England
Salisbury,* S. Rhodesia, †118,772
Salmon (river), Idaho
Salmon Arm, B.C., 1,506
Salmon Gums, Australia, 188
Salon, France, 10,625
Salonika, Greece, 250,920
Salonta, Rumania, 16,276
Salt (lakes), Australia
Salt Lake City,* Utah, 189,454
Salta, Argentina, †121,491
Saltcoats, Saskatchewan, 490
Saltcoats, Scotland, 14,187
Saltillo, Mexico, 99,101
Salto, Argentina, 7,771
Salto, Uruguay, 55,425
Salton (sea), Calif.
Salûm, Egypt, 1,343
Saluzzo, Italy, 11,312
Salvador (Bahia), Brazil, 389,422
Salween (river), Burma
Salzburg, Austria, 106,892
Salzgitter, Ger., 110,176
Salzkammergut (region), Austria
Salzwedel, Germany, 24,564
Sam Neua, Laos
Samalkot, India, 22,349
Samandağ, Turkey, 13,922
Samar (isl.), Phil. Is., 470,678
Samara (Kuybyshev), U.S.S.R., 806,000
Samarai, Papua, 777
Samarinda, Indonesia, 49,289
Samarkand, U.S.S.R., 195,000
Samarra, Iraq, 33,000
Samarskoye, U.S.S.R., 2,211
Sambalpur, India, 17,079
Sambas, Indonesia, †53,290
Sambhal, India, 53,887
Sambiase, Italy, 13,761
Sambre (river), Europe
Samch'ŏk, S. Korea, 30,169
Samnan, Iran, 29,036
Samoa (isls.), Pacific, 113,065
Samokov, Bulgaria, 12,784
Sámos (island), Greece, 41,124
Sampang, Indonesia, †47,596
Sampit, Indonesia
Samsun, Turkey, 87,311
San, Mali, 6,883
San Andres (mountains), New Mex.
San Andrés de Giles, Arg., 5,392
San Andrés Tuxtla, Mex., 19,830
San Antonio (cape), Argentina
San Antonio, Chile, 27,980
San Antonio, Tex., 587,718
San Antonio de Areco, Arg., 7,436
San Antonio de los Baños, Cuba, 17,783
San Benedetto del Tronto, Italy, 18,015
San Bernardino, Calif., 91,922
San Bernardino (mts.), Calif.
San Bernardo, Chile, 53,847
San Carlos, Venezuela, 7,174
San Carlos (lake), Ariz.
San Carlos de Bariloche, Arg., 6,562
San Cataldo, Italy, 23,828
San Clemente (island), Calif.
San Cristóbal, Argentina, 9,071
San Cristóbal, Dom. Rep., 15,525
San Cristóbal (Ciudad de las Casas), Mexico, 23,355
San Cristobal (island), Sol. Is. Prot., 8,000
San Cristóbal, Venezuela, 98,777
San Diego, Calif., 573,224
San Diego (cape), Argentina
San Felipe, Chile, 13,168
San Felipe, Venezuela, 29,096
San Fernando, Arg., 91,644
San Fernando, Chile, 21,774
San Fernando, Spain, 31,811
San Fernando, Venezuela, 13,377
San Francisco, Argentina, 24,354
San Francisco, Calif., 740,316
San Francisco, Mexico, 20,846
San Francisco de Macorís, Dom. Republic, 26,000
San Francisco del Oro, Mexico, 11,317
San Germán, Puerto Rico, 7,790
San Giovanni in Fiore, Italy, 17,443
San Isidro, Arg., 25,070
San Joaquin (river), Calif.
San Jorge (gulf), Arg.
San Jose, Calif., 204,196
San José,* Costa Rica, †154,734
San Jose, Philippine Isls., 2,259
San José de Chiquitos, Bolivia, 1,933
San José de Mayo, Uruguay, 21,048
San Juan, Argentina, 106,746
San Juan, Dom. Rep., 20,449
San Juan, Mexico, 11,179
San Juan,* Puerto Rico, 432,377
San Juan (river), U.S.
San Julián, Argentina, 3,050
San Luis, Argentina, 25,147
San Luis Potosí, Mex., 159,640
San Marco in Lamis, Italy, 21,592
San Marcos, Colombia, 2,482
San Marino,* San Marino, 2,418
San Martín (lake), Argentina
San Martín Texmelucan, Mexico, 15,378
San Matías (gulf), Argentina

* designates capitals

† designates inclusion of suburbs

San Miguel, El Salvador, 38,330
San Miguel, Mexico, 14,853
San Miguel (river), Bolivia
San Nicolás, Argentina, 25,029
San Nicolas (island), Calif.
San Pablo del Monte, Mex., 13,139
San Pedro, Argentina, 12,778
San Pedro, Mexico, 25,173
San Pedro de Macorís, Dom. Rep., 22,935
San Pedro Sula, Hond., 58,126
San Rafael, Argentina, 28,847
San Ramón, Peru, 3,030
San Remo, Italy, 30,705
San Salvador,* El Salvador, 248,100
San Sebastián, Spain, †135,149
San Severo, Italy, 47,875
San Vicente, El Salvador, 15,189
San Vito dei Normanni, Italy, 17,351
San'a,* Yemen, 75,000
Sanaga (river), Cameroon
Sanandaj, Iran, 40,651
Sánchez, Dom. Republic, 4,587
Sancti-Spíritus, Cuba, 37,741
Sandakan, No. Borneo, 28,806
Sandanski, Bulgaria, 7,422
Sanday (island), Scotland, 22
Sandefjord, Norway, 6,954
Sandgate, Australia, 20,756
Sandikli, Turkey, 9,384
Sandomierz, Poland, 10,900
Sandoway, Burma
Sandringham, Australia, 37,001
Sandstone, Australia, 72
Sandviken, Sweden, 21,934
Sandy (cape), Australia
Sandy (lake), Ont.
Sangamner, India, 18,730
Sangerhausen, Germany, 16,220
Sanggau, Indonesia, †28,039
Sangju, S. Korea, 46,925
Sangkulirang, Indonesia, 6,108
Sangli, India, 37,756
Sangre de Cristo (mts.), N. Mex.
Sanjo, Japan, 71,594
Sankt Gallen, Switz., 76,279
Sankt Michel (Mikkeli), Finland, 19,782
Sankt Pölten, Austria, 40,319
Sankt Valentin, Austria, 7,746
Sankt Veit, Austria, 10,952
Sankuru (river), R.o.t. Congo
Sanlúcar de Barrameda, Spain, 28,741
Sannicandro Garganico, Italy, 15,773
Sânnicolaul Mare, Rum., 9,956
Sanok, Poland, 15,300
Sansanné-Mango, Togo, 11,000
Santa Ana, Bolivia, 2,225
Santa Ana, Calif., 100,350
Santa Ana, El Salvador, 73,864
Santa Bárbara, Honduras, 4,928
Santa Bárbara, Mexico, 15,892
Santa Barbara (channel), Calif.
Santa Catalina (island), Calif.
Santa Clara, Cuba, 77,398
Santa Cruz, Bolivia, 69,560
Santa Cruz (island), Calif.
Santa Cruz (islands), Sol. Is. Prot., 5,000
Santa Cruz de la Palma, Canary Islands, Spain, †12,967
Santa Cruz de Tenerife,* Canary Islands, Spain, †133,100
Santa Elena, Ecuador, 2,764
Santa Fe, Argentina, 163,791
Santa Fe,* N. Mex., 34,676
Santa Inés (island), Chile
Santa Isabel,* Fern. Po, †37,237
Santa Isabel (island), Sol. Is. Prot., 5,500
Santa Maria, Brazil, 78,682
Santa Maria Capua Vetere, Italy, 27,943
Santa Marta, Colombia, 59,290
Santa Monica, Calif., 83,249
Santa Rosa, Argentina, 14,623
Santa Rosa, Ecuador, 4,672
Santa Rosa (island), Calif.
Santa Rosa de Copán, Honduras, 7,963
Santa Vitória do Palmar, Brazil, 8,224
Santa Tecla (Nueva San Salvador), El Salvador, 26,911
Santai, China, 70,000
Santander, Colombia, 4,421
Santander, Spain, †118,435
Santarém, Brazil, 24,924
Santarém, Portugal, 13,114
Santeramo in Colle, Italy, 19,360
Santiago,* Chile, 1,895,198
Santiago, Dom. Rep., 83,523
Santiago, Mexico, 10,985
Santiago, Panama, 8,746
Santiago, Spain, 31,140
Santiago (mountains), Texas
Santiago (river), Mexico
Santiago de Cuba, Cuba, 163,237
Santiago del Estero, Arg., 60,039
Santipur, India, 29,892
Santo Amaro, Brazil, 17,226
Santo Ângelo, Brazil, 25,415
Santo António do Zaire, Angola, 528
Santo Domingo (Ciudad Trujillo),* Dom. Rep., 367,053
Santos, Brazil, 262,048
São Borja, Brazil, 20,339
São Francisco, Brazil, 4,074
São Francisco (river), Brazil
São Francisco do Sul, Brazil, 9,825
São João da Bôa Vista, Brazil, 25,226
São João del Rei, Brazil, 34,654
São José do Rio Prêto, Brazil, 66,476
São Leopoldo, Brazil, 41,023
São Lourenço (river), Brazil
São Luís, Brazil, 124,606
São Mateus, Brazil, 6,075
São Paulo, Brazil, †3,776,581
São Paulo de Olivença, Brazil, 1,157
São Salvador, Angola, 2,965
São Sebastião (island), Brazil, 5,500
São Tomé,* S.T. and Pr., 5,607
São Tomé (island), S.T. and Pr., 59,102
Saône (river), France
Saparua, Indonesia, 53,390
Sapporo, Japan, 523,839
Saqqiz, Iran, 12,729
Sar-i-Pul, Afghan., 5,000
Sara Buri, Thailand, 7,112
Sarab, Iran, 14,820
Saragossa, Spain, †326,316
Sarajevo, Yugoslavia, 142,423
Saransk, U.S.S.R., 90,000
Sarapul, U.S.S.R., 68,000
Saratov, U.S.S.R., 581,000
Saravane, Laos
Sardarshahr, India, 26,048
Sardinia (Sardegna) (island), Italy, 1,276,023
Sargodha, Pakistan, 112,000
Sari, Iran, 26,278
Sarikamiş, Turkey, 17,573
Sarina, Australia, 2,119
Sariwŏn, N. Korea, 42,957
Sariyer, Turkey, 23,978
Sarnia, Ontario, 50,976
Sarny, U.S.S.R., 7,587
Saronno, Italy, 20,710
Sárospatak, Hungary, 12,917
Sarpsborg, Norway, 13,310
Sarreguemines, France, 12,876
Sasaram, India, 27,201
Sasebo, Japan, 262,484
Saskatchewan (river), Canada
Saskatoon, Saskatchewan, 95,526
Sassandra, Ivory Coast, 5,000
Sassandra (river), Ivory Coast
Sassari, Italy, 60,043
Sata (cape), Japan
Satadougou, Mali, 1,291
Satara, India, 36,405
Satna, India, 11,575
Sátoraljaújhely, Hung., 16,197
Satpura (mountain range), India
Satu Mare, Rumania, 52,096
Saugor, India, 63,933
Sault Sainte Marie, Ont., 43,088
Saumarez (reef), Australia
Saumlaki, Indonesia
Saumur, France, 15,528
Sava (river), Yugoslavia
Savaii (island), W. Samoa, 21,000
Savanna la Mar, Jamaica, 9,776
Savannah, Ga., 149,245
Savannah (river), U.S.
Savannakhet, Laos
Savant Lake, Ontario, 97
Savantvadi, India, 10,024
Savanur, India, 12,628
Savé, Dahomey, 5,128
Saveh, Iran, 14,537
Săveni, Rumania, 6,470
Saverne, France, 8,218
Savona, Italy, 62,397
Savonlinna, Finland, 14,728

* designates capitals

† designates inclusion of suburbs

Sawahlunto, Indonesia, 12,000
Sawankhalok, Thailand, 5,205
Say, Niger, 2,202
Sayaboury, Laos
Sayan (mountains), U.S.S.R.
Sayram, U.S.S.R., 12,791
Sayula, Mexico, 11,596
Scarborough, England, 42,587
Sceaux, France, 8,320
Schaerbeek, Belgium, 118,270
Schaffhausen, Switz., 30,904
Schefferville, Quebec, 3,178
Schenectady, N.Y., 81,682
Scheveningen, Neth., 65,998
Schiedam, Netherlands, 80,299
Schiltigheim, France, 22,168
Schio, Italy, 19,466
Schleswig, Germany, 33,767
Schmalkalden, Germany, 12,663
Schneidemühl (Piła), Pol., 31,800
Schönebeck, Germany, 44,578
Schöneberg, Germany, 188,739
Schöningen, Germany, 16,148
Schramberg, Germany, 18,114
Schreiber, Ontario, 2,050
Schuler, Alberta, 188
Schumacher, Ontario, 3,017
Schwabach, Germany, 23,696
Schwäbisch Gmund, Germany, 41,050
Schwandorf, Germany, 16,062
Schwaner (mountains), Indonesia
Schwaz, Austria, 9,467
Schweidnitz (Świdnica), Poland, 35,400
Schweinfurt, Germany, 56,894
Schwelm, Germany, 33,986
Schwenningen, Germany, 31,743
Schwerin, Germany, 92,481
Schwetzingen, Germany, 14,992
Sciacca, Italy, 22,333
Scicli, Italy, 19,916
Scilly (islands), Eng., 2,273
Scone, Australia, 2,680
Scranton, Pa., 111,443
Scunthorpe, England, 67,257
Scutari (Shkodër), Albania, 38,564
Scutari (Üsküdar), Turkey, 69,671
Sea (islands), U.S.
Seaham, England, 26,048
Seattle, Wash., 557,087
Seba, Indonesia
Sebeş, Rumania, 11,628
Sebha, Libya, †7,193
Şebinkarahisar, Turkey, 8,771
Sebnitz, Germany, 13,653
Sedan, France, 16,684
Sedel'nikovo, U.S.S.R., 570
Segezha, U.S.S.R., 5,400
Ségou, Mali, 15,000
Segovia, Spain, †33,360
Séguéla, Ivory Coast, 4,750
Sehore, India, 16,831
Seine (river), France
Sekadau, Indonesia
Sekondi, Ghana, 35,000
Selb, Germany, 19,239

Selenga (river)
Séléstat, France, 10,225
Selkirk, Manitoba, 8,576
Selkirk (mountains), Br. Col.
Selsey Bill (prom.), England
Selukwe, S. Rhodesia, 1,001
Semarang, Indonesia, 411,922
Sembiyam, India, 37,625
Seminoe (res.), Wyo.
Semiozernyy, U.S.S.R., 3,144
Semipalatinsk, U.S.S.R., 155,000
Semitau, Indonesia, †9,255
Sena Madureira, Brazil, 1,799
Sendai, Japan, 425,272
Senegal (river)
Senftenberg, Germany, 17,783
Senhor do Bonfim, Brazil, 13,958
Senigallia, Italy, 20,600
Sennar, Sudan, 10,700
Senneterre, Quebec, 3,246
Sens, France, 17,184
Senta, Yugoslavia, 25,524
Seoni, India, 20,570
Seoul,* S. Korea, 2,444,883
Sept-Îles, Quebec, 14,196
Seraing, Belgium, 41,790
Serampore, India, 55,339
Serang, Indonesia, †43,661
Serangoon, Singapore, 10,481
Serdobol' (Sortavala), U.S.S.R., 13,000
Serdobsk, U.S.S.R., 18,616
Seremban, Malaya, 52,020
Sergo (Kadiyevka), U.S.S.R., 180,000
Seria, Brunei
Serian, Sarawak, 1,236
Sernyy Zavod, U.S.S.R., 1,812
Serov, U.S.S.R., 98,000
Serowe, Bech. Pr., 15,935
Serpa, Portugal, 7,273
Serpents Mouth (strait), S.A.
Serpukhov, U.S.S.R., 105,000
Serra do Navio, Brazil, 9
Sérrai, Greece, 40,063
Sestao, Spain, 17,950
Sestroretsk, U.S.S.R.
Sète, France, 29,914
Sétif, Algeria, 40,168
Setit (river), Africa
Seto, Japan, 64,681
Setúbal, Portugal, †44,235
Seul (lake), Ont.
Sevastopol', U.S.S.R., 148,000
Seventy Mile House, Br. Columbia, 512
Severn (river), Ont.
Severn (river), England
Severnaya Zemlya (islands), U.S.S.R.
Severo-Kuril'sk, U.S.S.R.
Severo-Yeniseyskiy, U.S.S.R., 5,100
Severodvinsk, U.S.S.R., 79,000
Severoural'sk, U.S.S.R., 30,000
Sevier (lake), Utah
Sevier (river), Utah
Seville (Sevilla), Spain, †442,300

Sevlievo, Bulgaria, 9,856
Sèvres, France, 15,112
Sexsmith, Alberta, 531
Seychelles (islands), 41,425
Seyhan (Adana), Turkey, 230,024
Seymchan, U.S.S.R.
Sfantu Gheorghe, Rum., 17,638
Sfax, Tunisia, 54,637
Shadrinsk, U.S.S.R., 52,000
Shahat, Libya, 494
Shahjahanpur, India, 117,225
Shahriza, Iran, 29,311
Shahrud, Iran, 17,058
Shajapur, India, 10,757
Shakhrisyabz, U.S.S.R., 14,200
Shakhty, U.S.S.R., 196,000
Shamo (Gobi) (desert)
Shamva, S. Rhodesia, 577
Shanghai, China, 6,204,417
Shangjao, China, 75,000
Shangkiu, China, 134,400
Shanhaikwan, China
Shannon (river), Ireland
Shaohing, China, 130,600
Shaoyang, China, 117,700
Shaqra, Saudi Arabia, 16,000
Sharasume (Altai), China
Shari (Chari) (river), Chad
Sharja, Tr. Oman, 4,000
Shark (bay), Australia
Sharlyk, U.S.S.R., 4,577
Shasi, China, 85,800
Shasta (mountain), Calif.
Shaulyay (Šiauliai), U.S.S.R., 60,000
Shaunavon, Saskatchewan, 2,154
Shawinigan, Quebec, 32,169
Shchelkovo, U.S.S.R., 12,330
Shcherbakov (Rybinsk), U.S.S.R., 181,000
Shchigry, U.S.S.R., 7,043
Shediac, New Brunswick, 2,159
Sheerness, England, 14,123
Sheet Harbour, Nova Scotia, 1,073
Shefar'am, Israel, 7,000
Sheffield, England, 493,954
Sheikh Sa'id, Yemen, 1,000
Shelburne, Nova Scotia 2,408
Shellbrook, Saskatchewan, 1,042
Shelter Bay, Quebec, 450
Shendi, Sudan, 15,050
Shenkursk, U.S.S.R., 2,536
Shenyang (Mukden), China, 2,299,900
Shepetovka, U.S.S.R., 14,693
Sherbro (island), Sierra Leone, 107,962
Sherbrooke, Nova Scotia, 324
Sherbrooke, Quebec, 66,554
Sherridon, Manitoba, 1,500
Shetland (islands), Scotland, 17,809
Shibam, Aden Pr., 6,000
Shibarghan, Afghan., 20,000

Shiel (lake), Scotland
Shigatse, China
Shihr, Aden Pr., 11,000
Shikarpur, Pakistan, 45,376
Shikoku (island), Japan, 4,121,423
Shilka (river), U.S.S.R.
Shillong, India, 38,192
Shimanovsk, U.S.S.R., 2,703
Shimizu, Japan, 142,983
Shimoga, India, 27,712
Shimonoseki, Japan, 246,941
Shin (lake), Scotland
Shindand (Sabzawar), Afghanistan, 5,000
Shingu, Japan, 39,114
Shinjo, Japan, 31,140
Shinko (Chinko) (river), Central African Rep.
Shipley, England, 29,762
Shirane (mountain), Japan
Shiraz, Iran, 170,659
Shire (river), Africa
Shivpuri, India, 15,490
Shizuoka, Japan, 328,819
Shkodër (Scutari), Albania, 38,564
Shkotovo, U.S.S.R., 2,522
Shoal Lake, Manitoba, 774
Sholapur, India, 337,544
Shorapur, India, 11,836
Shreveport, La., 164,372
Shrewsbury, England, 49,726
Shumen (Kolarovgrad), Bulgaria, 41,670
Shurab, U.S.S.R., 3,000
Shuri, Ryukyu Islands, 25,316
Shushenskoye, U.S.S.R., 3,104
Shushtar, Iran, 18,527
Shuya, U.S.S.R., 64,000
Shwebo, Burma, 13,590
Shwegyin, Burma
Shwenyaung, Burma
Si Kiang (river), China
Sialkot, Pakistan, 168,000
Siam (gulf)
Sian (Siking), China, 787,300
Siangtan, China, 183,600
Šiauliai, U.S.S.R., 60,000
Šibenik, Yugoslavia, 17,932
Siberut (island), Indonesia, 11,524
Sibiu, Rumania, 90,475
Sibolga, Indonesia, 33,472
Siborongborong, Indonesia, †30,143
Sibu, Sarawak, 29,249
Sicily (island), Italy, 4,486,749
Sicuani, Peru, 10,663
Sidcup and Chislehurst, England, 86,907
Siderno, Italy, 9,735
Sidērókastron, Greece, 8,177
Sidhpur, India, 24,565
Sidi Barrani, Egypt, 1,583
Sidi-bel-Abbès, Algeria, 72,985
Sidi Ifni,* Ifni, Spain, †12,751
Sidlaw (hills), Scotland
Sidmouth (cape), Australia
Sidoardjo, Indonesia, †40,591
Sidon (Saida), Lebanon, 17,739

Sidra (gulf), Libya
Siedlce, Poland, 31,100
Siegburg, Germany, 33,974
Siegen, Germany, 49,404
Siemianowice Śląskie, Poland, 58,100
Siena, Italy, 40,722
Sieradz, Poland, 13,000
Sierning, Austria, 7,535
Sierpc, Poland, 10,600
Sierra Nevada (mountains), Calif.
Sighet, Rumania, 22,361
Sighişoara, Rumania, 20,363
Sigli, Indonesia, 4,050
Siguiri, Guinea, 11,003
Sihanoukville, Camb., 6,000
Siirt, Turkey, 22,898
Sikar, India, 32,334
Sikasso, Mali, 14,300
Sikhote-Alin' (mt. range), U.S.S.R.
Siking (Sian), China, 787,300
Silao, Mexico, 24,138
Silchar, India, 16,601
Siliguri, India, 10,487
Silistra, Bulgaria, 16,180
Silkeborg, Denmark, 24,465
Silva Porto, Angola, 32,754
Silvânia, Brazil, 1,778
Silverton, Australia, 141
Simcoe, Ontario, 8,754
Simeulue (island), Indonesia, 25,931
Simferopol', U.S.S.R., 189,000
Simla, India, 18,348
Simleul Silvaniei, Rumania, 8,560
Simonstown, C. of G. Hope, 8,272
Simpson (desert), Australia
Sinabang, Indonesia
Sinaia, Rumania, 9,006
Sincelejo, Colombia, 11,014
Sindangbarang, Indonesia, †41,223
Sing Buri, Thailand, 5,430
Singa, Sudan, 16,950
Singapore,* Singapore, †1,264,000
Singaradja, Indonesia, 12,345
Singen, Germany, 33,267
Singkang, Indonesia, †17,948
Singkawang, Indonesia, †61,107
Singleton, Australia, 4,519
Singora (Songkhla), Thailand, 17,842
Sinhailien, China, 207,600
Sining, China, 93,700
Sinj, Yugoslavia, 3,316
Sinnamary, Fr. Guiana, 1,373
Sinoia, S. Rhodesia, 1,465
Sinsiang, China, 170,500
Sint-Niklaas, Belgium, 47,547
Sintang, Indonesia, †25,067
Sintra, Portugal, 7,150
Sinŭiju, N. Korea, 118,414
Siokun, Phil Is., 2,922
Sioux City, Iowa, 89,159
Sioux Falls, S. Dak., 65,466
Sioux Lookout, Ontario, 2,453
Sir Edward Pellew (islands), Australia
Siracusa (Syracuse), Italy, 67,224

Sirajganj, Pakistan, 37,545
Siret, Rumania, 5,664
Siret (river), Rumania
Sirohi, India, 9,501
Sironj, India, 13,906
Sirsa, India, 20,718
Sirsi, India, 10,451
Sisak, Yugoslavia, 19,238
Sisaket, Thailand, 6,520
Sisophon, Cambodia
Sitapur, India, 35,249
Sittard, Netherlands, 28,262
Sittingbourne and Milton, England, 23,616
Situbondo, Indonesia, 30,000
Sivas, Turkey, 93,849
Siverek, Turkey, 26,071
Sivrihisar, Turkey, 7,186
Siwa, Egypt, 878
Siwa (oasis), Egypt, 3,799
Skagerrak (strait), Europe
Skarżysko-Kamienna, Poland, 34,300
Skeena (river), Br. Col.
Skellefteå, Sweden, 22,760
Skerries (islands), Wales
Skien, Norway, 15,466
Skierniewice, Poland, 21,700
Skive, Denmark, 15,558
Skopje (Skoplje), Yugoslavia, 161,983
Skövde, Sweden, 23,917
Skovorodino, U.S.S.R.
Skye (island), Scotland, 7,765
Slagelse, Denmark, 20,562
Slaney (river), Ireland
Slănic, Rumania, 6,842
Slatina, Rumania, 13,381
Slave (river), Canada
Slavgorod, U.S.S.R., 4,420
Slavgorod, U.S.S.R., 18,000
Slavonski Brod (Brod), Yugoslavia, 21,858
Slavyanoserbsk, U.S.S.R., 3,170
Slavyansk, U.S.S.R., 83,000
Sliedrecht, Netherlands, 16,572
Slieve Aughty (mountains), Ireland
Slieve Bloom (mountains), Ireland
Sligo, Ireland, 13,138
Sligo (bay), Ireland
Sliven, Bulgaria, 46,383
Slobodskoy, U.S.S.R., 18,600
Slobozia, Rumania, 9,632
Slocan, Br. Columbia, 293
Slough, England, 80,503
Słupsk (Stolp), Poland, 53,300
Slyne Head (cape), Ireland
Smederovo, Yugoslavia, 18,328
Smidovich, U.S.S.R., 2,495
Smith, Alberta, 350
Smithers, Br. Columbia, 2,487
Smiths Falls, Ontario, 9,603
Smoky (river), Alta.
Smoky Hill (river), Kans.
Smoky Lake, Alberta, 626
Smolensk, U.S.S.R., 146,000
Smooth Rock Falls, Ontario, 1,131
Smyrna (Izmir), Turkey, 370,923
Snaefell (mountain), Isle of Man

* designates capitals

† designates inclusion of suburbs

Snake (river), U.S.
Sneek, Netherlands, 19,881
Snow Lake, Manitoba, 659
Snowden (mountain), Wales
Snowdrift, N.W. Terrs., 111
Soalala, Malg. Rep., 673
Sobral, Brazil, 32,281
Soc Trang, S. Vietnam, 17,050
Sochaczew, Poland, 15,800
Soche (Yarkand), China, 80,000
Sochi, U.S.S.R., 95,000
Society (islands), Fr. Polynesia, 41,798
Socuellamos, Spain, 11,818
Söderhamn, Sweden, 12,951
Södertälje, Sweden, 33,014
Soë, Indonesia
Soerabaja (Surabaja), Indonesia, 1,043,283
Soerakarta (Surakarta), Indonesia, 393,547
Soest, Germany, 33,304
Sofia,* Bulgaria, 725,756
Sogamosa, Colombia, 5,216
Sogne (fjord), Norway
Sohag, Egypt, 60,306
Sohar, Oman, 7,000
Soissons, France, 18,901
Söke, Turkey, 23,442
Sokna, Libya, 1,250
Sokode, Togo, 15,508
Sokolo, Mali, 3,200
Sokoto, Nigeria, 47,643
Sol'-Iletsk, U.S.S.R., 11,096
Solbad Hall, Austria, 10,680
Solca, Rumania, 2,384
Solikamsk, U.S.S.R., 47,000
Solingen, Germany, 169,930
Solnechnogorsk, U.S.S.R., 14,600
Solo (Surakarta), Indonesia, 393,547
Solok, Indonesia, 6,214
Solomon (isls.), Pacific, 139,232
Solothurn (Soleure), Switzerland, 18,394
Soltau, Germany, 14,375
Soluk, Libya, 2,500
Solway (firth)
Soma, Turkey, 13,119
Sombor, Yugoslavia, 37,802
Somerset (island), N.W. Terrs.
Somerset West, C. of G. Hope, 8,243
Son (river), India
Son La, N. Vietnam
Sŏnch'on, N. Korea, 22,725
Sönderborg, Denmark, 20,653
Sondershausen, Germany, 13,118
Sonepur (Sonpur Raj), India, 9,065
Song Cau, S. Vietnam
Sŏngjin, N. Korea, 67,778
Songkhla, Thailand, 17,842
Sonneberg, Germany, 21,534
Sonpur Raj, India, 9,065
Sonsonate, El Salvador, 23,137
Soochow, China, 474,000
Sopot (Zoppot), Poland, 44,500
Sopron, Hungary, 41,246
Sora, Italy, 9,193
Sorata, Bolivia, 2,087
Sorel, Quebec, 17,147
Soria, Spain, †19,301
Sorocaba, Brazil, 68,811
Sorochinsk, U.S.S.R., 11,179
Sorong, West Irian
Sorrento, Italy, 7,947
Sorsogon, Philippine Islands, 35,548
Sortavala, U.S.S.R., 4,528
Sosnowiec, Poland, 131,600
Sos'va, U.S.S.R., 2,334
Sotteville, France, 18,271
Souillac, Mauritius, 1,905
Souphlíon, Greece, 6,693
Souris, Manitoba, 1,841
Souris (river), U.S.-Canada
Souris East, P.E.I., 1,537
Sousse, Tunisia, 36,566
South Bend, Ind., 132,445
South China (sea), Asia
South Downs (hills), England
South Junction, Manitoba, 236
South Orkney (islands)
South Platte (river), U.S.
South Porcupine, Ontario, 4,017
South Ronaldsay (island), Scotland, 1,247
South Saskatchewan (river), Canada
South Shetland (islands)
South Shields, England, 109,533
South Suburban, India, 185,600
South Uist (island), Scotland, 3,983
Southampton, England, 204,707
Southampton, Ontario, 1,818
Southampton (island), N.W. Terrs.
Southend-on-Sea, England, 164,976
Southern Cross, Australia, 625
Southport, Australia, 8,134
Southport, England, 81,976
Sovetsk, U.S.S.R., 40,000
Sovetsk, U.S.S.R., 4,827
Sovetskaya Gavan', U.S.S.R.
Soya (cape), Japan
Spalato (Split), Yugo., 99,462
Spandau, Germany, 165,509
Spanish Town, Jamaica, 14,424
Sparta, Greece, 10,412
Spassk-Dal'niy, U.S.S.R., 23,000
Spencer's (gulf), Australia
Spennymoor, England, 19,104
Sperrin (mountains), Ireland
Spey (river), Scotland
Speyer, Germany, 38,485
Spezia, La, Italy, 105,301
Spirit River, Alberta, 890
Spišská Nová Ves, Czech., 16,877
Spittal, Austria, 10,034
Split, Yugoslavia, 99,462
Split Lake, Manitoba, 500
Spokane, Wash., 181,608
Spoleto, Italy, 21,659
Spremberg, Germany, 17,498
Springbok, C. of G. Hope, 3,111
Springdale, Newfoundland, 1,638
Springfield,* Ill., 83,271
Springfield, Mass., 174,463
Springfield, Mo., 95,865
Springfield, Ohio, 82,723
Springhill, Nova Scotia, 5,836
Springlands, Br. Guiana, 1,199
Springsure, Australia, 814
Spurn Headland (prom.), England
Squamish, Br. Columbia, 1,517
Squinzano, Italy, 13,277
Sragen, Indonesia, 32,310
Srebrenica, Yugoslavia, 1,280
Sredne-Kolymsk, U.S.S.R., 2,000
Sredne-Ural'sk, U.S.S.R, 8,800
Śrem, Poland, 10,400
Sremska Mitrovica, Yugoslavia, 15,546
Sremski Karlovci, Yugo., 5,618
Sretensk, U.S.S.R., 12,800
Sri Ganganagar, India, 16,136
Srinagar, India, 284,753
Środa, Poland, 12,700
Stade, Germany, 30,542
Stafford, England, 47,814
Stalin (Braşov), Rumania, 123,834
Stalin (Communism) (mt.), U.S.S.R.
Stalin (Musala) (mountain), Bulgaria
Stalinabad (Dushanbe), U.S.S.R., 224,000
Stalingrad (Volgograd), U.S.S.R., 591,000
Staliniri (Tskhinvali), U.S.S.R., 22,000
Stalino (Donetsk), U.S.S.R., 701,000
Stalinogorsk (Novomoskovsk), U.S.S.R., 107,000
Stalinsk (Novokuznetsk), U.S.S.R., 377,000
Stalowa Wola, Poland, 21,800
Stalybridge, England, 21,940
Stanichno-Luganskoye, U.S.S.R., 3,139
Stanislav (Stanisławów), U.S.S.R., 66,000
Stanke Dimitrov, Bulg., 19,234
Stanley, Australia, 818
Stanley,* Falkland Islands, 1,252
Stanley (falls), R.o.t. Congo
Stanleyville, R.o.t. Congo, 79,951
Stanovoy (mt. range), U.S.S.R.
Stanthorpe, Australia, 3,234
Stara Kanjiža (Kanjiža), Yugo, 11,290
Stara Zagora, Bulgaria, 55,322
Starachowice, Poland, 35,700
Staraya Lyalya, U.S.S.R., 708
Staraya Russa, U.S.S.R., 26,700
Stargard Szczeciński, Poland, 27,700
Starobel'sk, U.S.S.R., 13,973
Starogard Gdański, Poland, 22,100
Staroutkinsk, U.S.S.R., 5,900
Staryy Oskol, U.S.S.R., 26,697
Stassfurt, Germany, 29,762
Stavanger, Norway, 52,762

Stavropol', U.S.S.R., 140,000
Stawell, Australia, 5,506
Steep Rock, Manitoba, 192
Steep Rock Lake, Ontario, 80
Stefăneşti, Rumania, 7,770
Steinbach, Manitoba, 3,739
Stellenbosch, C. of G. Hope, 22,233
Stendal, Germany, 40,325
Stepanakert, U.S.S.R., 20,000
Stephenville, Newfoundland, 6,043
Stepnoy (Elista), U.S.S.R., 22,000
Stepnyak, U.S.S.R., 25,000
Sterlitamak, U.S.S.R., 111,000
Stettin (Szczecin), Poland, 268,900
Stettler, Alberta, 3,638
Stewart, Br. Columbia, 327
Stewart (cape), Australia
Stewart (river), Yukon
Steyr, Austria, 38,105
Stikine (river), Br. Col.
Štip, Yugoslavia, 13,845
Stirling, Scotland, 27,553
Stockerau, Austria, 11,824
Stockholm,* Sweden, 808,484
Stockport, England, 142,469
Stockton, Calif., 86,321
Stockton-on-Tees, England, 81,198
Stoke-on-Trent, England, 265,506
Stolberg, Germany, 37,462
Stolp (Słupsk), Poland, 53,300
Stony Tunguska (river), U.S.S.R.
Storm (bay), Tasmania, Australia
Storozhevsk, U.S.S.R., 2,045
Stour (river), England
Stourbridge, England, 43,917
Stralsund, Germany, 50,389
Strand, C. of G. Hope, 13,313
Strangford (bay), N. Ireland
Strasbourg, France, 192,253
Strasbourg, Sask., 636
Stratford, New Zealand, 5,273
Stratford, Ontario, 20,467
Stratford-on-Avon, Eng., 16,847
Strathalbyn, Australia, 1,465
Strathfield, Australia, 26,429
Strathmore, Alberta, 924
Strathmore (valley), Scotland
Strathroy, Ontario, 5,150
Strathy (point), Scotland
Straubing, Germany, 36,348
Streaky Bay, Australia, 766
Strehaia, Rumania, 8,545
Stretford, England, 60,331
Stromboli, (island), Italy, 546
Stronsay (island), Scotland, 504
Stroud, England, 17,461
Struga, Yugoslavia, 4,996
Strumica, Yugoslavia, 12,149
Strzelce Opolskie, Poland, 10,900
Stuart (Alice Springs), Australia, 4,648
Stuarts (mt. range), Australia
Stung Treng, Cambodia, 2,875

Sturgeon Falls, Ontario, 6,288
Stuttgart, Germany, 637,539
Suakin, Sudan, 6,900
Subang, Indonesia, †22,825
Subotica, Yugoslavia, 74,433
Suceava, Rumania, 20,949
Suchan, U.S.S.R., 40,000
Süchow, China, 373,200
Suck (river), Ireland
Sucre,* Bolivia, 62,339
Sudau, Papua
Sudbury, Ontario, 80,120
Sudbury, Greater, Ontario, 110,694
Sueca, Spain, 17,024
Suez, Egypt, 201,242
Sufi-Kishlak, U.S.S.R., 1,602
Suhl, Germany, 24,598
Suihwa, China, 36,000
Suir (river), Ireland
Suita, Japan, 116,765
Suiteh, China
Sukabumi, Indonesia, 71,560
Sukadana, Indonesia, 6,899
Sukamara, Indonesia
Sukhothai, Thailand, 9,979
Sukhumi, U.S.S.R., 64,000
Sukkertoppen, Greenland, †1,635
Sukkur, Pakistan, 103,000
Sulaiman (mt. range), Pakistan
Sulaimaniya, Iraq, 79,813
Sulina, Rumania, 3,622
Sulisker (island), Scotland
Sulitjelma (mountain)
Sullana, Peru, 27,500
Sulmona, Italy, 19,847
Sultan, Ontario, 125
Sulu (arch.), Phil. Is., 240,826
Sulu (sea), Asia
Sulyukta, U.S.S.R., 10,078
Sumatra (island), Indonesia, 13,781,213
Sumba (Sandalwood) (island), Indonesia, 268,544
Sumbawa, Indonesia, †22,308
Sumbawa (island), Indonesia, 450,778
Sumburgh Headland (prom.), Scotland
Sumedang, Indonesia, †74,062
Sumenep, Indonesia, †33,628
Summer (lake), Oreg.
Summerland, Br. Columbia, 3,893
Summerside, P.E.I., 8,611
Šumperk, Czech., 19,365
Sumy, U.S.S.R., 97,000
Sunbury, Australia, 3,131
Sunda (strait), Indonesia
Sundarbans (swamp), India-Pakistan
Sundbyberg, Sweden, 26,987
Sunderland, England, 189,629
Sundown, Manitoba, 162
Sundridge, Ontario, 756
Sundsvall, Sweden, 29,355
Sungaipenuh, Indonesia
Sungari (river), China
Sungei Patani, Malaya, 22,886

Sungurlu, Turkey, 10,516
Suoyarvi (Suojärvi), U.S.S.R.
Supe, Peru, 2,495
Superior (lake), U.S.-Canada
Suphan Buri, Thailand, 7,980
Sur (Tyre), Lebanon, 9,455
Surabaja, Indonesia, 1,043,283
Surakarta, Indonesia, 393,547
Surat, India, 288,167
Surat Thani, Thailand, 10,423
Surendranagar, India, 21,622
Suresnes, France, 31,775
Surigao, Philippine Is., 37,413
Surin, Thailand, 8,768
Sussex, New Brunswick, 3,457
Sutlej (river), Pakistan
Sutton, Quebec, 1,755
Sutton-in-Ashfield, England, 40,438
Suva,* Fiji Isls., 37,371
Suwa, Japan, 44,035
Suwałki, Poland, 20,000
Suweilih, Jordan, 5,070
Suwŏn, S. Korea, 90,806
Suzak, U.S.S.R., 4,050
Svendborg, Denmark, 23,892
Sverdlovsk, U.S.S.R., 777,000
Sveti Vrach (Sandanski), Bulgaria, 7,422
Svetozarevo, Yugoslavia, 12,270
Svilajnac, Yugo., 5,049
Svilengrad, Bulgaria, 9,918
Svir' (river), U.S.S.R.
Svishtov, Bulgaria, 12,949
Svobodnyy, U.S.S.R., 57,000
Swakopmund, S.W. Africa, 4,660
Swale (river), England
Swan Hill, Australia, 6,186
Swan River, Manitoba, 3,163
Swansea, Wales, 166,740
Swansea (bay), Wales
Swatow, China, 280,400
Swellendam, C. of G. Hope, 4,896
Świdnica (Schweidnitz), Poland, 35,400
Świebodzin, Poland, 12,200
Świecie, Poland, 10,200
Świetochłowice, Poland, 58,000
Swift Current, Saskatchewan, 12,186
Swindon, England, 91,736
Sydney, Australia, †2,183,388
Sydney, Nova Scotia, 33,617
Sydney Mines, Nova Scotia, 9,122
Syktyvkar, U.S.S.R., 64,000
Sylhet, Pakistan, 32,773
Sylva, U.S.S.R., 4,428
Sylvan Lake, Alberta, 1,381
Syr-Dar'ya (river), U.S.S.R.
Syracuse (Siracusa), Italy, 67,224
Syracuse, N.Y., 216,038
Syrian (desert), Asia
Sýros, Greece, 14,402
Syzran', U.S.S.R., 148,000
Szamotuły, Poland, 11,000
Szarvas, Hungary, 18,946
Szczecin (Stettin), Poland, 268,900

Szczecinek, Poland, 22,110
Szczytno, Poland, 12,200
Szeged, Hungary, 99,061
Székesfehérvár, Hungary, 55,934
Szekszárd, Hungary, 19,347
Szentes, Hungary, 31,175
Szeping, China, 125,900
Szolnok, Hungary, 45,553
Szombathely, Hungary, 54,465
Szopienice, Poland, 52,600

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Tabas, Iran, 7,413
Tabelbala, Algeria, 447
Taber, Alberta, 3,951
Tábor, Czech., 19,561
Tabora, Tang., 15,361
Tabou, Ivory Coast, 3,600
Tabriz, Iran, 289,996
Tachikawa, Japan, 63,644
Tacloban, Philippine Is., 53,607
Tacna, Peru, 26,212
Tacoma, Wash., 147,979
Tacuarembó, Uruguay, 17,854
Tademait (plateau)
Tadoussac, Quebec, 1,083
Taegu, S. Korea, 678,277
Taejŏn, S. Korea, 229,393
Taganrog, U.S.S.R., 201,000
Tagant (region), Mauritania, 41,000
Tagus (river)
Tahan (mountain), Malaya
Tahat (mountain), Algeria
Tahiti (island), Fr. Polynesia, 29,684
Tahoe (lake), U.S.
Tahoua, Niger, 11,629
Tahuna, Indonesia
Taichung, China, 249,946
Taif, Saudi Arabia, 15,000
Taimyr (Taymyr)(peninsula), U.S.S.R.
Tainan, China, 287,797
Taipei,* China, 748,510
Taiping, Malaya, 48,183
Taira, Japan, 71,115
Taitao (peninsula), Chile
Taiwan (island), China, 11,031,341
Taiwan (strait), China
Taiyiba, Israel, 7,601
Taiyüan, China, 720,700
Ta'izz,* Yemen, 25,000
Tajo (Tagus) (river)
Tak (Rahaeng), Thailand, 8,246
Takada, Japan, 73,238
Takamatsu, Japan, 228,172
Takaoka, Japan, 135,190
Takasaki, Japan, 142,152
Takatsuki, Japan, 79,043
Takawa, Japan, 95,911
Takayama, Japan, 50,588
Takeo, Cambodia, 7,160
Takingeun, Indonesia, 1,411
Taklamakan (desert), China
Takoradi, Ghana, 41,000
Talara, Peru, 26,486
Talass, U.S.S.R.
Talavera de la Reina, Spain, 21,228
Talbot (cape), Australia
Talca, Chile, 68,148
Talcahuano, Chile, 83,404
Taldy-Kurgan, U.S.S.R., 41,000
Talien (Dairen), China, 766,400
Tallahassee,* Fla., 48,174
Tallinn (Tallin), U.S.S.R., 280,000
Taltal, Chile, 5,291
Tamale, Ghana, 40,000
Tamanrasset, Algeria, 2,710
Tamar (river), England
Tamatave, Malg. Rep., 39,627
Tambacounda, Senegal, 3,766
Tambo, Australia, 586
Tambov, U.S.S.R., 170,000
Tambovka, U.S.S.R., 3,113
Tame, Colombia, 1,154
Tampa, Fla., 274,970
Tampere (Tammerfors), Finland, 126,573
Tampico, Mexico, 122,197
Tamrida,* Socotra, Aden Prot.
Tamworth, Australia, 18,984
Tana (lake), Ethiopia
Tana (river), Europe
Tanabe, Japan, 48,673
Tanana (river), Alaska
Tananarive,* Malg. Rep., 247,917
Tanda, India, 26,128
Tandil, Argentina, 32,309
Tandjung, Indonesia
Tandjungbalai, Indonesia, 11,218
Tandjungpandan, Indonesia, †39,253
Tandjungpinang, Indonesia, 5,789
Tandjungpriok, Indonesia, 140,573
Tandjungpura, Indonesia, †20,726
Tandjungredeb, Indonesia, 1,672
Tandjungselor, Indonesia, 1,991
Tando Adam, Pakistan, 21,260
Tanga, Tang., 38,053
Tanganyika (lake), Africa
Tangerang, Indonesia, †81,042
Tangermünde, Germany, 16,480
Tangier, Morocco, 147,946
Tangshan, China, 693,300
Tanjong Katong, Singapore, 25,951
Tanjore, India, 110,968
Tannu (mountains), Asia
Tanta, Egypt, 180,639
Tantan, Morocco, 877
Taonan, China, 56,315
Tapachula de Domínguez, Mexico, 41,701
Tapajós (river), Brazil
Tapanshang, China
Taquarí (river), Brazil
Tara, U.S.S.R.
Tarabulus (Tripoli), Lebanon, 59,001
Tarakan, Indonesia, 24,807
Taranto, Italy, 146,745
Taranto (gulf), Italy
Tarare, France, 9,130
Tarawa (island), Gilbert Is.,3,582
Tarbat Ness (prom.), Scotland
Tarbes, France, 37,018
Taree, Australia, 10,050
Tarfaya, Morocco, 1,521
Târgovişte, Rumania, 24,360
Târgul-Frumos, Rumania, 4,665
Târgul-Jiu, Rumania, 19,618
Târgul-Mureş, Rumania, 65,194
Târgul-Neamţ, Rumania, 10,373
Târgul-Ocna, Rumania, 11,227
Târgul-Săcuesc, Rumania, 7,500
Tarija, Bolivia, 20,486
Tarim (river), China
Tarkwa, Ghana, 14,000
Tarlac, Philippine Is., 98,131
Tarma, Peru, 15,404
Tarnopol (Ternopol'), U.S.S.R., 52,000
Tarnów, Poland, 68,300
Tarnowskie Góry, Poland, 27,600
Taroom, Australia, 628
Taroudant, Morocco, 17,141
Tarragona, Spain, †43,519
Tarrasa, Spain, 54,949
Tarsus, Turkey, 51,310
Tartagal, Argentina, 8,539
Tartu, U.S.S.R., 74,000
Tarutung, Indonesia, †41,041
Taschereau, Quebec, 646
Tashauz, U.S.S.R., 37,000
Tashkent, U.S.S.R., 911,000
Tashkumyr, U.S.S.R., 3,198
Tashkurghan, Afghan., 30,000
Tashtyp, U.S.S.R., 2,667
Tasikmalaja, Indonesia, †101,466
Tasman (peninsula), Tas., Australia
Tasman (sea), Pacific
Tatabánya, Hungary, 52,044
Tatar (strait), U.S.S.R.
Tatarsk, U.S.S.R.
Tateyama, Japan, 57,643
Tatnam (cape), Man.
Tatta, Pakistan, 9,716
Tatung, China, 228,500
Taunggyi, Burma
Taung, C. of G. Hope, 1,923
Taunton, England, 35,178
Tauranga, New Zealand, †24,659
Taurianova, Italy, 17,212
Taurus (mountains), Turkey
Tavani, N.W. Terrs.
Tavas, Turkey, 7,858
Tavastehus (Hämeenlinna), Finland, 28,321

Tavda, U.S.S.R., 25,266
Tavira, Portugal, 7,496
Tavoy, Burma, 40,066
Tavşanli, Turkey, 11,538
Tawau, N. Borneo, 10,276
Taxco de Alarcón, Mexico, 16,604
Tay (firth), Scotland
Tay (lake), Scotland
Tay (river), Scotland
Tay Ninh, S. Vietnam, 25,000
Tayga, U.S.S.R., 33,800
Taymyr (peninsula), U.S.S.R.
Tayshet, U.S.S.R., 17,000
Taytay, Philippine Is., 506
Tayü, China
Taza, Morocco, 31,796
Tbilisi, U.S.S.R., 694,000
Tczew, Poland, 32,900
Te Awamutu, New Zealand, 5,425
Te Kuiti, New Zealand, 4,492
Tébessa, Algeria, 18,293
Techirghiol, Rumania, 2,705
Tecuala, Mexico, 10,747
Tecuci, Rumania, 23,400
Tedzhen, U.S.S.R.
Tees (river), England
Tefé, Brazil, 2,781
Tegal, Indonesia, 86,762
Tegucigalpa,* Honduras, 133,887
Tehachapi (mountains), Calif.
Tehran,* Iran, †1,513,164
Tehuacán, Mexico, 31,724
Tehuantepec, Mexico, 13,440
Teifi (river), England
Tejo (Tagus) (river)
Tekirdağ, Turkey, 23,905
Tel Aviv-Jaffa, Israel, 386,612
Tela, Honduras, 13,408
Telde, Canary Is., Spain, †32,177.
Telegraph Creek, Br. Columbia, 75
Tellicherry, India, 36,320
Teltow, Germany, 10,950
Teluk Anson, Malaya, 37,040
Telukbajur, Indonesia
Telukbetung, Indonesia, 101,801
Temassinin (Ft-Flatters), Algeria, 362
Temir, U.S.S.R., 4,126
Temir-Tau, U.S.S.R., 54,000
Temora, Australia, 4,469
Tempelhof, Germany
Temuco, Chile, 72,132
Temuka, New Zealand, 2,431
Ten Thousand (islands), Fla.
Tenali, India, 40,639
Tenasserim, Burma
Tenggarong, Indonesia, †15,516
Tengiz (lake), U.S.S.R.
Tenkodogo, Upper Volta, 4,955
Tennant Creek, Australia, 837
Tennessee (river), U.S.
Tenterfield, Australia, 3,105
Teocaltiche, Mexico, 11,066
Teófilo Otôni, Brazil, 41,013
Tepatitlán, Mexico, 19,609
Tepic, Mexico, 53,955

Teplaya Gora, U.S.S.R., 2,400
Teplice, Czech., 42,893
Teramo, Italy, 25,984
Terek (river), U.S.S.R.
Teresina, Brazil, 144,799
Terijoki (Zelenogorsk), U.S.S.R.
Termez, U.S.S.R., 22,000
Termini Imerese, Italy, 24,978
Ternate, Indonesia, 23,500
Terni, Italy, 53,163
Ternopol', U.S.S.R., 52,000
Terrace, Br. Columbia, 1,477
Terracina, Italy, 17,474
Terranova di Sicilia (Gela), Italy, 43,326
Terre Haute, Ind., 72,500
Teruel, Spain, †19,726
Teschen (Ceský Těšín), Czech., 15,508
Teschen (Cieszyn), Poland, 23,200
Teslin, Yukon, 254
Teslin (lake), Canada
Tete, Mozambique, 2,733
Tetovo, Yugoslavia, 20,209
Tetuan, Morocco, 104,455
Tetyukhe, U.S.S.R.
Tetyushi, U.S.S.R., 8,500
Teulon, Manitoba, 749
Teziutlán, Mexico, 17,384
Tezpur, India, 11,879
Tha Chin, Thailand, 20,316
Thai Binh, N. Vietnam
Thai Nguyen, N. Vietnam
Thakhek, Laos
Thale, Germany, 18,082
Thames (river), England
Thames, New Zealand, 5,315
Thana, India, 101,103
Thangool, Australia, 198
Thanh Hoa, N. Vietnam
Thar (desert), India
Thargomindah, Australia, 163
Tharrawaddy, Burma, 8,326
Thaton, Burma, 18,220
Thayetmyo, Burma, 11,847
Thazi, Burma
The Cheviot (mountain), England
The Hague ('s Gravenhage),* Neth., 606,728
The Pas, Manitoba, 4,671
The Peak (mountain), England
Thebes, Greece, 15,779
Thelon (river), Canada
Theodore, Australia, 714
Thessalon, Ontario, 1,725
Thessalonikē (Salonika), Greece, 250,920
Thetford Mines, Quebec, 21,618
Thiers, France, 11,180
Thiès, Senegal, 69,140
Thionville, France, 21,009
Thomson (river), Australia
Thonburi, Thailand, 194,185
Thonon-les-Bains, France, 11,267
Thorn (Toruń), Poland, 104,800
Thornaby-on-Tees, England, 22,786
Thouars, France, 9,903
Thouin (cape), Australia
Three Hills, Alberta, 1,491

Three Rivers (Trois-Rivières), Quebec, 53,477
Thu Dau Mot, S. Vietnam, 25,000
Thule, Greenland, †206
Thun, Switzerland, 29,034
Thurles, Ireland, 6,421
Thursday (island), Australia, 2,218
Thysville, R.o.t. Congo, 15,448
Tiaret, Algeria, 22,344
Tibagi, Brazil, 1,444
Tiber (Tevere) (river), Italy
Tiberias, Israel, 19,782
Tibet (plateau), China
Tibooburra, Australia, 138
Tichitt, Mauritania, 3,100
Ticul, Mexico, 10,809
Tidjikja, Mauritania, 5,700
Tiehling, China, 52,945
Tien Shan (mt. range), China
Tien Yen, N. Vietnam
Tienen (Tirlemont), Belgium, 22,583
Tienshui, China, 63,000
Tientsin, China, 2,693,831
Tierra Blanca, Mexico, 16,474
Tierra del Fuego (isl.), S.A.
Tietê (river), Brazil
Tiflis (Tbilisi), U.S.S.R., 694,000
Tigre, Arg., †91,824
Tigre (river), Peru
Tigris (river)
Tihwa (Urumchi), China, 140,700.
Tijuana, Mexico, 151,939
Tikhoretsk, U.S.S.R., 34,700
Tikhvin, U.S.S.R., 16,400
Tiksi, U.S.S.R.
Tilburg, Netherlands, 131,277
Tilemsi (valley), Mali
Tilichiki, U.S.S.R., 164
Tillabéri, Niger, 1,008
Tilsit (Sovetsk), U.S.S.R., 40,000
Timagami, Ontario, 500
Timaru, New Zealand, †26,424
Timbuktu, Mali, 7,000
Timimoun, Algeria, 4,345
Timiskaming Station, Quebec, 2,517
Timişoara, Rumania, 142,257
Timmins, Ontario, 29,270
Timor (island), Asia
Tiñaquillo, Venezuela, 8,130
Tindouf, Algeria, 1,872
Tinian (island), Mariana Is., 368
Tinnevelly (Tirunelveli), India, 60,676
Tipperary, Ireland, 4,703
Tiranë (Tirana),* Albania, 108,183
Tiraspol', U.S.S.R., 62,000
Tirat Karmel, Israel, 10,832
Tire, Turkey, 26,530
Tiree (island), Scotland, 1,216
Tiruchendur, India, 11,110
Tiruchirapalli, India, 249,933
Tirunelveli, India, 60,676
Tirupati, India, 20,143
Tiruppattur, India, 23,008
Tiruvannamalai, India, 33,575

* designates capitals

† designates inclusion of suburbs

Tisdale, Saskatchewan, 2,402
Tisul', U.S.S.R., 3,925
Tisza (river)
Titagarh, India, 57,416
Titicaca (lake), S.A.
Titograd (Podgorica), Yugoslavia, 16,324
Titov Veles, Yugo., 19,373
Titovo Užice, Yugoslavia, 13,255
Tivoli, Italy, 22,035
Tiv'on, Israel, 9,400
Tixtla, Mexico, 8,542
Tizi-Ouzou, Algeria, 4,700
Tiznit, Morocco, 7,694
Tjalang, Indonesia
Tjepu, Indonesia, 41,748
Tjiamis, Indonesia, †80,018
Tjiandjur, Indonesia, †77,927
Tjidjulang, Indonesia, 32,475
Tjilatjap, Indonesia, 78,619
Tjimahi, Indonesia, †90,718
Tjirebon, Indonesia, 135,984
Tlalnepantla, Mexico, 23,886
Tlalpan, Mexico, 22,957
Tlaxiaco, Mexico, 6,123
Tlemcen, Algeria, 53,233
Tobelo, Indonesia, †14,430
Tobol (river), U.S.S.R.
Tobol'sk, U.S.S.R., 32,200
Tobruk, Libya, 4,130
Tocantinópolis, Brazil, 3,736
Tocantins (river), Brazil
Tochigi, Japan, 73,446
Tocopilla, Chile, 21,580
Tofino, Br. Columbia, 440
Tokanui, New Zealand, 237
Tokat, Turkey, 32,725
Tokelau (Union) (islands), Pacific, 1,388
Tokmak, U.S.S.R., 19,431
Tokorosawa, Japan, 65,903
Tokushima, Japan, 182,782
Tokuyama, Japan, 77,246
Tokyo,* Japan, 8,310,027
Tolbukhin, Bulgaria, 42,815
Toledo, Ohio, 318,003
Toledo, Spain, †40,651
Tolitoli (Kampung Baru), Indonesia, 8,333
Tollygunge, India, 150,527
Toluca, Mexico, 76,871
Tomakomai, Japan, 62,384
Tomar, Portuagl, 8,034
Tomari, U.S.S.R., 11,381
Tomaszów Mazowiecki, Poland, 47,300
Tombigbee (river), United States
Tombouctou (Timbuktu), Mali, 7,000
Tomelloso, Spain, †27,815
Tomini (gulf), Indonesia
Tommot, U.S.S.R., 2,800
Tompkins, Saskatchewan, 453
Tomsk, U.S.S.R., 249,000
Tonalá, Mexico, 12,204
Tonbridge, England, 22,141
Tondano, Indonesia, †29,584
Tönder, Denmark, 7,192
Tonga (Friendly) (islands), Pacific, 46,870
Tongareva (Penrhyn) (isl.), Cook Is., 654
Tongatapu (island), Tonga, 20,000
Tonk, India, 38,650
Tonkin (gulf)
Tonle (lake), Cambodia
Tönsberg, Norway, 12,420
Tontonicapán, Guat., 9,492
Toowoomba, Australia, 50,134
Top (lake), U.S.S.R.
Topeka,* Kans., 119,484
Torbay Head (cape), Australia
Torgau, Germany, 18,455
Torino (Turin), Italy, 711,282
Torne (river), Sweden
Tornio (Tornea), Finland, 5,517
Törökszentmiklós, Hung., 23,576
Toronto,* Ontario, 672,407
Toronto, Greater, Ont., 1,824,481
Toropets, U.S.S.R., 10,733
Torquay, England, 53,915
Torre Annunziata, Italy, 51,170
Torre del Greco, Italy, 54,677
Torredonjimeno, Spain, 14,833
Torremaggiore, Italy, 17,665
Torrens (lake), Australia
Torrente, Spain, 12,856
Torreón, Mexico, 179,955
Torres (strait)
Tôrres Novas, Port., 7,291
Tórshavn,* Faeroe Isls., 7,447
Tortona, Italy, 17,496
Tortorici, Italy, 2,443
Tortosa, Spain, 15,150
Tortuga, La (island), Ven.
Toruń (Thorn), Poland, 104,800
Tory (island), Ireland
Tosno, U.S.S.R., 13,000
Tosya, Turkey, 13,690
Tot'ma, U.S.S.R., 10,000
Totness, Surinam, 1,019
Tottenham, Australia, 527
Tottori, Japan, 104,833
Touggourt, Algeria, 17,253
Toul, France, 8,971
Toulon, France, 125,572
Toulouse, France, 268,863
Toungoo, Burma, 25,960
Tourane (Da Nang), S. Vietnam, 100,978
Tourcoing, France, 73,772
Tournai (Doornik), Belg., 33,339
Tours, France, 80,261
Townsville, Australia, 51,143
Towy (river), England
Toy-Tyube, U.S.S.R., 2,453
Toyama, Japan, 207,266
Toyanaka, Japan, 199,065
Toyohara (Yuzhno-Sakhalinsk), U.S.S.R., 86,000
Toyohashi, Japan, 215,515
Toyooka, Japan, 39,700
Tozeur, Tunisia, 12,464
Tra Vinh, S. Vietnam, 19,000
Trabzon, Turkey, 52,680
Tracadie, New Brunswick, 1,357
Traiguén, Chile, 9,990
Trail, Br. Columbia, 11,580
Tralee, Ireland, 10,714
Trang, Thailand, 8,622
Trani, Italy, 33,204
Tranquebar, India, 11,111
Transcona, Manitoba, 14,248
Trans-Himalayas (mt. range), Tibet, China
Transylvanian Alps (mt. range), Rumania
Trapani, Italy, 64,945
Traun, Austria, 16,037
Traunstein, Germany, 14,394
Trautenau (Trutnov), Czech., 22,961
Travnik, Yugoslavia, 8,163
Trbovlje, Yugoslavia, 14,566
Trebíč, Czech, 19,181
Trebizond (Trabzon), Turkey, 52,680
Treherne, Manitoba, 569
Treinta y Tres, Uruguay, 18,856
Trelleborg, Sweden, 19,259
Tremadoc (bay), Wales
Trenčín, Czech., 22,279
Trenggalek, Indonesia, †37,762
Trenque Lauquen, Arg., 10,671
Trent (river), England
Trento, Italy, 39,287
Trenton,* N. J., 114,167
Trenton, N.S., 3,240
Trenton, Ontario, 13,183
Treptow, Germany, 108,035
Tres Arroyos, Argentina, 29,996
Três Lagoas, Brazil, 14,520
Tres Puntas (cape), Argentina
Trèves (Trier), Germany, 87,141
Treviglio, Italy, 17,031
Treviso, Italy, 52,988
Trichinopoly (Tiruchirapalli), India, 249,933
Trichur, India, 57,524
Trier (Trèves), Germany 87,141
Trieste, Italy, 269,543
Triglav (mountain), Yugoslavia
Tríkkala, Greece, 27,876
Trincomalee, Ceylon, 29,146
Trinec, Czech., 21,924
Trinidad, Bolivia, 14,148
Trinidad, Cuba, 16,756
Trinidad, Uruguay, 17,233
Trinity, Newfoundland, 639
Trinity (bay), Australia
Trinity (river), Texas
Tripoli (Tarabulus), Lebanon, 59,001
Tripoli,* Libya, 130,238
Trípolis, Greece, 18,500
Trivandrum, India, 186,931
Trnava, Czech., 31,732
Trois-Pistoles, Quebec, 4,349
Trois-Rivières (Three Rivers), Quebec, 53,477
Troitsk, U.S.S.R., 76,000
Troitsko-Pechorsk, U.S.S.R., 558
Troitskoye, U.S.S.R., 2,171
Trollhättan, Sweden, 31,901
Tromsö, Norway, 12,363
Trondheim, Norway, 58,583
Trondheim (fjord), Norway
Troon, Scotland, 9,932
Troppau (Opava), Czech., 42,523
Trou-du-Nord, Haiti, 2,918
Trout (lake), N.W. Terrs.

Trouville, France, 6,781
Troy, N.Y., 67,492
Troyes, France, 57,089
Trujillo, Honduras, 3,460
Trujillo, Peru, 99,808
Trujillo, Venezuela, †18,935
Truk (islands), Caroline Is., 10,252
Truro, Australia, 214
Truro, England, 13,328
Truro, N.S., 12,421
Trutnov, Czech., 22,961
Tsaidam (marsh), China
Tsamkong, China, 166,000
Tsangpo (river), China
Tselinograd, U.S.S.R., 101,000
Tsesis (Cēsis), U.S.S.R., 8,748
Tshikapa, R.o.t. Congo, 27,765
Tsinan, China, 680,100
Tsingkiang, China, 77,000
Tsingtao, China, 916,800
Tsining, China, 86,200
Tsitsihar, China, 344,700
Tskhinvali, U.S.S.R., 22,000
Tsu, Japan, 110,900
Tsu (islands), Japan, 69,556
Tsuchiura, Japan, 71,474
Tsumeb, S.W. Africa, 7,796
Tsunyi, China, 97,500
Tsuruga, Japan, 53,493
Tsuruoka, Japan, 83,149
Tsushima (strait), Japan
Tsuyama, Japan, 78,549
Tuamotu (arch.), Fr. Polynesia, 6,138
Tuapse, U.S.S.R., 29,600
Tuban, Indonesia, 48,123
Tubarão, Brazil, 11,740
Tübingen, Germany, 49,631
Tubuai (Austral) (islands), Fr. Polynesia, 3,915
Tucson, Ariz., 212,892
Tucumán, Argentina, 194,166
Tucupita, Venezuela, †9,900
Tudela, Spain, 12,449
Tuguegarao, Phil. Is., 43,044
Tukums, U.S.S.R., 8,144
Tula, U.S.S.R., 345,000
Tulancingo, Mexico, 26,663
Tulare (lake), Calif.
Tulcán, Ecuador, 10,658
Tulcea, Rumania, 24,639
Tuléar, Malg. Rep., 33,850
Tulkarm, Jordan, 19,343
Tullamore, Ireland, 6,243
Tulle, France, 15,813
Tully, Australia, 2,678
Tulsa, Okla., 261,685
Tuluá, Colombia, 12,017
Tulun, U.S.S.R., 30,000
Tulungagung, Indon., 43,115
Tumaco, Colombia, 12,692
Tumbarumba, Australia, 1,511
Tumbes, Peru, 19,033
Tumkur, India, 21,893
Tunbridge Wells, England, 39,855
Tunghwa, China, 129,100
Tungkiang, China, 96,652
Tungliao, China, 44,110
Tungting (lake), China
Tunguska, Lower (river), U.S.S.R.
Tunguska, Stony (river), U.S.S.R.
Tunguska, Upper (river), U.S.S.R.
Tuni, India, 13,060
Tunis,* Tunisia, 364,593
Tunja, Colombia, 50,450
Tupiza, Bolivia, 8,248
Tura, U.S.S.R.
Turbat-i-Haidari, Iran, 19,830
Turbat-i-Shaikh Jam, Iran, 6,756
Turbo, Colombia, 2,636
Turda, Rumania, 33,614
Turen, Indonesia, †57,711
Turfan, China
Tŭrgovishte, Bulgaria, 10,505
Turgutlu, Turkey, 31,697
Turhal, Turkey, 17,159
Turin, Italy, 838,675
Turkestan, U.S.S.R., 44,000
Túrkeve, Hungary, 12,505
Turku (Åbo), Finland, 124,243
Turnhout, Belgium, 35,912
Tŭrnovo, Bulgaria, 16,182
Turnu Măgurele, Rumania, 18,055
Turnu Severin, Rumania, 32,486
Turrialba, Costa Rica, 5,449
Turtkul', U.S.S.R., 19,600
Turtleford, Saskatchewan, 352
Tushino, U.S.S.R., 90,000
Tuticorin, India, 124,273
Tutrakan, Bulgaria, 7,203
Tuttlingen, Germany, 24,874
Tutuila (island), Amer. Samoa, 15,556
Tuwaiq (mountain range), Saudi Arabia
Tuxpan (Jalisco), Mex., 10,871
Tuxpan (Nayarit), Mex., 14,863
Tuxpan (Veracruz), Mex., 23,222
Tuxtla Gutiérrez, Mex., 41,532
Tuyen Quang, N. Vietnam
Tuzla, Yugoslavia, 37,673
Tver (Kalinin), U.S.S.R., 261,000
Tweed, Ontario, 1,791
Tweed (river), Scotland
Twillingate, Newfoundland, 994
Two Wells, Australia, 379
Tychy, Poland, 41,000
Tyne (river), England
Tynemouth, England, 70,112
Tyre (Sur), Lebanon, 9,455
Tyrrhenian (sea), Italy
Tyumen', U.S.S.R., 150,000
Tyurya-Kurgan, U.S.S.R., 1,260
Tzekung, China, 291,300
Tzepo, China, 184,200

U

Ubangi (river), Africa
Ube, Japan, 166,632
Ubeda, Spain, †28,956
Uberaba, Brazil, 72,053
Ubon, Thailand, 9,690
Ubsa (lake), Mongolia
Ucayali (river), Peru
Uccle (Ukkel), Belgium, 71,612
Uch-Kurgan, U.S.S.R., 4,422
Udaipur, India, 111,182
Uddevalla, Sweden, 34,166
Udine, Italy, 65,199
Udipi, India, 18,043
Udon Thani, Thailand, 11,995
Ueda, Japan, 70,186
Uele (river), R.o.t. Congo
Uelen, U.S.S.R.
Uelzen, Germany, 25,043
Ufa, U.S.S.R., 546,000
Uglegorsk, U.S.S.R., 35,115
Uherské Hradiště, Czech., 12,825
Uige (Carmona), Angola, 1,474
Uiju (Gishu), N. Korea, 27,378
Uitenhage, C. of G. Hope, 48,146
Ujfehértó, Hungary, 14,874
Ujiji, Tang., 25,000
Ujjain, India, 144,996
Ujpest, Hungary, 68,530
Ukhta, U.S.S.R.
Ulan Bator,* Mongolia, 100,000
Ulan-Ude, U.S.S.R., 174,000
Ulanhot, China, 51,400
Uleåborg (Oulu), Finland, 58,315
Ulee Lheue, Indonesia, 626
Uliassutai, Mong., 6,000
Ulm, Germany, 92,701
Ulverstone, Australia, 5,962
Ul'yanovka, U.S.S.R., 3,732
Ul'yanovsk, U.S.S.R., 205,000
Ume (river), Sweden
Umeå, Sweden, 22,542
Umm el Fahm, Israel, 7,523
Umrer, India, 19,361
Umtali, S. Rhodesia, 17,170
Umtata, C. of G. Hope, 12,287
Unao (Unnao), India, 20,107
Uncía, Bolivia, 4,507
Ungava (bay), Canada
Ungvár (Uzhgorod), U.S.S.R., 47,000
Union (Tokelau) (islands), Pacific, 1,388
Unity, Saskatchewan, 1,902
Unley, Australia, 40,280
Unnao, India, 20,107

* designates capitals

† designates inclusion of suburbs

Unst (island), Scotland, 1,151
Upernavik, Greenland, †555
Upington, C. of G. Hope, 20,249
Upolu (island), W. Samoa, 54,000.
Upper Erne (lake), Ireland
Upper Hutt, New Zealand, 16,861
Upper Klamath (lake), Oreg.
Upper Tunguska (river), U.S.S.R.
Uppsala, Sweden, 77,397
Upsala, Ontario, 190
Ura-Tyube, U.S.S.R., 24,300
Ural (mountain (range), U.S.S.R.
Ural (river), U.S.S.R.
Ural'sk, U.S.S.R., 105,000
Uranium City, Sask., 1,794
Uraricuera (river), Brazil
Urawa, Japan, 168,757
Urda, U.S.S.R., 4,282
Ure (river), England
Urfa, Turkey, 59,910
Urga (Ulan Bator),* Mong., 100,000
Urgench, U.S.S.R., 43,000
Urla, Turkey, 10,796
Urlaţi, Rumania, 8,658
Urmia (Reza'iyeh), Iran, 67,605
Urmia (lake), Iran
Uruapan, Mexico, 45,580
Uruguaiana, Brazil, 32,639
Uruguay (river), S.A.
Urumchi, China, 140,700
Urup (island), U.S.S.R.
Uryupinsk, U.S.S.R., 14,409
Urziceni, Rumania, 6,061
Usa (river), U.S.S.R.
Uşak, Turkey, 28,927
Usakos, S.W. Africa, 4,242
Ushuaia, Argentina, 2,198
Üsküb (Skopje), Yugo., 161,983
Üsküdar, Turkey, 111,654
Usman', U.S.S.R., 13,456
Usol'ye-Sibirskoye, U.S.S.R.
Uspenka, U.S.S.R., 3,680
Ussuri (river), Asia
Ussuriysk, U.S.S.R., 104,000
Ust'-Kamenogorsk, U.S.S.R., 117,000
Ust'-Koksa, U.S.S.R., 360
Ust'-Kulom, U.S.S.R., 2,479
Ust'-Ordynskiy, U.S.S.R.
Ust'-Tsil'ma, U.S.S.R., 3,264
Ust'-Urt (plateau), U.S.S.R.
Ust'-Uyskoye, U.S.S.R., 4,195
Uster, Switzerland, 17,252
Ustí nad Labem, Czech., 63,819
Usulután, El Salvador, 12,094
Usumacinta (river), Mexico
Usumbura,* Burundi, 27,294
Utah (lake), Utah
Uthai Thani, Thailand, 7,364
Utica, N.Y., 100,410
Utrecht, Netherlands, 247,816
Utrera, Spain, 26,279
Utsunomiya, Japan, 239,007
Uttaradit, Thailand, 5,494
Uttarpara, India, 13,610
Uusikaarlepyy (Nykarleby), Finland, 1,055
Uusikaupunki (Nystad), Finland, 4,531
Uvat, U.S.S.R., 637
Uwajima, Japan, 68,106
'Uweinat (mountain)
Uyuni, Bolivia, 6,968
Uzgen, U.S.S.R., 13,120
Uzhgorod (Užhorod), U.S.S.R., 47,000
Uzunköprü, Turkey, 18,310

V

Vaal (river), So. Africa
Vaasa (Vasa), Finland, 42,688
Vác, Hungary, 24,748
Vaduz,* Liecht., 3,398
Vakh (river), U.S.S.R.
Val-Brillant, Quebec, 879
Val-d'Or, Quebec, 10,983
Val Marie, Saskatchewan, 443
Valdepeñas, Spain, †25,706
Valdés (peninsula), Argentina
Valdivia, Chile, 61,334
Valença, Brazil, 17,137
Valence, France, 36,659
Valencia, Spain, †505,066
Valencia, Venezuela, †163,601
Valenciennes, France, 37,716
Valentia (Valencia) (island), Ireland, 1,015
Valenza, Italy, 11,740
Valera, Venezuela, 46,646
Valga, U.S.S.R., 10,842
Valjevo, Yugoslavia, 17,977
Valkeakoski, Finland, 14,180
Valladolid, Mexico, 9,306
Valladolid, Spain, †151,807
Valle de Santiago, Mexico, 20,879
Valle Grande, Bolivia, 5,094
Vallecas, Spain, 4,218
Vallenar, Chile, 15,693
Valletta,* Malta, 18,202
Valleyfield, Quebec, 27,297
Valognes, France, 2,997
Valparaíso, Chile, 252,865
Valuyki, U.S.S.R., 10,243
Valverde, Dom. Rep., 17,885
Van, Turkey, 22,018
Van (lake), Turkey
Van Diemen (cape), Australia
Van Diemen (gulf), Australia
Van Gia, S. Vietnam
Vancouver, B.C., 384,522
Vancouver, Greater, B.C., 790,165
Vancouver (island), B.C.
Vanderhoof, B.C., 1,460
Vänern (lake), Sweden
Vänersborg, Sweden, 18,469
Vanimo, Terr. New Guinea
Vaniyambadi, India, 31,281
Vankarem, U.S.S.R.
Vannes, France, 23,377
Vanua Levu (island), Fiji Is., 39,958
Varanasi, India, 573,558
Varanger (fjord), Norway
Varaždin, Yugoslavia, 19,341
Varberg, Sweden, 14,507
Vardar (river)
Varel, Germany, 12,381
Varese, Italy, 36,882
Varginha, Brazil, 24,944
Varkaus, Finland, 22,238
Varna, Bulgaria, 119,769
Varnsdorf, Czech., 13,416
Vasile Roaită, Rumania, 3,286
Vaslui, Rumania, 14,850
Västerås, Sweden, 77,778
Västervik, Sweden, 18,198
Vasto (Istonio), Italy, 14,036
Vatican City, 1,010
Vatomandry, Malg. Rep., 3,587
Vatra Dornei, Rumania, 10,822
Vättern (lake), Sweden
Vaupés (river), Colombia
Växjö, Sweden, 23,971
Vaygach (Vaigach) (isl.), U.S.S.R.
Vechta, Germany, 13,451
Vecsés, Hungary, 15,537
Vegreville, Alberta, 2,908
Vejle, Denmark, 31,362
Velika Kikinda (Kikinda), Yugoslavia, 33,906
Velikaya Guba, U.S.S.R., 171
Veliki Bečkerek (Zrenjanin), Yugoslavia, 48,956
Velikiy Ustyug, U.S.S.R., 23,382
Velikiye Luki, U.S.S.R., 59,000
Velletri, Italy, 15,870
Vellore, India, 113,580
Velp, Netherlands, 18,566
Velsen, Neth., 59,948
Vel'sk, U.S.S.R., 3,499
Venado Tuerto, Arg., 15,947
Venezuela (gulf)
Vengurla, India, 21,663
Venice (Venezia), Italy, 291,635
Venissieux, France, 15,006
Venkatagiri, India, 16,408
Venlo, Netherlands, 51,719
Venosa, Italy, 13,154
Ventspils, U.S.S.R., 15,679
Veracruz, Mexico, 144,232
Veraval, India, 30,275
Verbania, Italy, 24,493
Vercelli, Italy, 39,647
Verde (cape), Senegal
Verde (river), Ariz.
Verden, Germany, 17,463
Verdun-sur-Meuse, France, 16,411
Verkh-Chebula, U.S.S.R., 2,616
Verkhne-Neyvinskiy, U.S.S.R., 4,057
Verkhne-Ural'sk, U.S.S.R., 10.005
Verkhne-Usinskoye, U.S.S.R., 2,242
Verkhneye, U.S.S.R., 11,153
Verkhniy Ufaley, U.S.S.R., 12,671

Verkhnyaya Pyshma, U.S.S.R., 10,800
Verkhnyaya Salda, U.S.S.R., 10,500
Verkhnyaya Sinyachikha, U.S.S.R. 2,272
Verkhnyaya Tura, U.S.S.R., 15,200
Verkhotur'ye, U.S.S.R., 4,689
Verkhoyansk, U.S.S.R.
Verkhoyansk (mountain range), U.S.S.R.
Verlo, Saskatchewan, 134
Vermilion, Alberta, 2,449
Vermilion (lake), Minn.
Vermilion Bay, Ontario, 98
Vernon, Br. Columbia, 10,250
Vernon, France, 10,033
Verona, Italy, 154,931
Verrettes, Haiti, 1,541
Vérroia, Greece, 25,765
Versailles, France, 72,038
Verviers, Belgium, 36,037
Vesoul, France, 10,744
Vest (fjord), Norway
Vesterålen (island), Norway, 33,375
Vesuvius (vol.), Italy
Veszprém, Hungary, 25,495
Vevey, Switzerland, 16,269
Viacha, Bolivia, 23,200
Viana, Brazil, 5,054
Viana do Castelo, Portugal, 14,023
Viareggio, Italy, 39,341
Vibo Valentia, Italy, 19,100
Viborg, Denmark, 23,265
Vicenza, Italy, 68,203
Vich, Spain, 13,678
Vichada (river), Colombia
Vichy, France, 30,099
Victor Harbor, Australia, 2,036
Victoria, Argentina, 17,711
Victoria,* Br. Columbia, †154,152
Victoria, Cam., 7,657
Victoria, Guinea, 1,269
Victoria,* Hong Kong, 1,000,000
Victoria (falls), Africa
Victoria (isl.), N.W. Terrs.
Victoria (lake), Africa
Victoria (river), Australia
Victoria de las Tunas, Cuba, 12,754
Victoria Point, Burma
Victoriaville, Quebec, 18,720
Vidin, Bulgaria, 18,580
Viedma, Argentina, 4,683
Viedma (lake), Argentina
Vienna,* Austria, 1,627,034
Vienne, France, 21,926
Vienne (river), France
Vientiane,* Laos, 70,000
Viersen, Germany, 41,890
Vierzon, France, 26,808
Vigan, Philippine Is., 25,999
Vigevano, Italy, 39,030
Vigo, Spain, †144,914
Viipuri (Vyborg), U.S.S.R., 51,000
Vijayavada, India, 233,634
Vila,* New Hebrides, 1,500
Vila de João Belo, Mozambique, 3,243
Vila de Manica, Moz., 9,000
Vila do Conde, Portugal, 7,772
Vila Franca de Xira, Portugal, 8,296
Vila Macedo de Cavaleiros, Angola, 2,631
Vila Real, Portugal, 9,285
Vila Teixeira de Sousa, Angola, 870
Vilcanota (mountain), Peru
Villa Acuña, Mexico, 20,204
Villa Ángela, Argentina, 7,375
Villa Cisneros, Sp. Sahara, Spain, †1,961
Villa de Cura, Venezuela, 19,787
Villa Dolores, Argentina, 13,385
Villa Frontera, Mexico, 14,339
Villa María, Argentina, 30,362
Villa Montes, Bolivia, 3,105
Villa Sanjurjo, Mor., 11,295
Villabruzzi, Somali Rep., †16,014
Villacarrillo, Spain, 11,928
Villach, Austria, 32,975
Villafranca de los Barros, Spain, 15,165
Villahermosa, Mexico, 51,611
Villanueva de Córdoba, Spain, 16,256
Villanueva de la Serena, Spain, 18,396
Villanueva y Geltrú, Spain, 16,382
Villarreal, Spain, 16,793
Villarrica, Chile, 9,122
Villarrica, Paraguay, 14,680
Villarrobledo, Spain, †21,356
Villavicencio, Colombia, 6,074
Ville-Marie, Quebec, 1,710
Ville-Saint-Georges, Quebec, 4,082
Villefranche-sur-Saône, France, 21,101
Villejuif, France, 23,542
Villemomble, France, 18,617
Villena, Spain, 15,065
Villeneuve, France, 18,279
Villeneuve-sur-Lot, France, 13,305
Villeurbanne, France, 79,829
Villiersdorp, C. of G. Hope, 1,586
Villingen, Germany, 31,889
Villupuram, India, 23,829
Vilna (Vil'nyus), U.S.S.R., 235,000
Vilvoorde (Vilvorde), Belgium, 31,654
Vilyuy (mt. range), U.S.S.R.
Vilyuy (river), U.S.S.R.
Vilyuysk, U.S.S.R.
Viña del Mar, Chile, 115,467
Vincennes, France, 48,851
Vindhya (hills), India
Vinh, N. Vietnam
Vinh Long, S. Vietnam, 30,000
Vinh Yen, N. Vietnam
Vinkovci, Yugoslavia, 19,179
Vinnitsa, U.S.S.R., 121,000
Viramgam, India, 27,834
Virden, Manitoba, 2,708
Vire, France. 3,179
Virgin (islands), 39,437
Virovitica, Yugoslavia, 11,684
Visakhapatnam, India, 181,683
Visby, Sweden, 15,626
Viscount Melville (sound), N.W. Terrs.
Viseu, Portugal, 13,190
Visim, U.S.S.R., 6,809
Visimo-Utkinsk, U.S.S.R.., 3,081
Vistula (Wisła) (river), Poland
Vitebsk, U.S.S.R., 148,000
Viterbo, Italy, 35,438
Viti Levu (island), Fiji Is.,176,822
Vitim (river), U.S.S.R.
Vitória, Brazil, 85,242
Vitoria, Spain, †73,701
Vitória da Conquista, Brazil, 46,778
Vitry, France, 52,540
Vittoria, Italy, 42,230
Vittorio Veneto, Italy, 20,113
Vizagapatam (Visakhapatnam), India, 181,683
Vizianagaram, India, 51,749
Vizinga, U.S.S.R., 321
Vizzini, Italy, 13,396
Vlaardingen, Netherlands, 68,427
Vladimir, U.S.S.R., 154,000
Vladivostok, U.S.S.R., 283,000
Vlissingen (Flushing), Neth., 29,148
Vlonë (Valona), Albania, 28,212
Vöcklabruck, Austria, 9,357
Voghera, Italy, 27,712
Vohémar, Malg. Rep., 2,925
Voiron, France, 9,847
Volchikha, U.S.S.R., 6,731
Volga (river), U.S.S.R.
Volgograd, U.S.S.R., 591,000
Völklingen, Germany, 42,644
Volkovysk, U.S.S.R., 15,027
Volodarskiy, U.S.S.R., 3,960
Vologda, U.S.S.R., 138,000
Vólos, Greece, †67,424
Vol'sk, U.S.S.R., 62,000
Volta (river)
Volta Redonda, Brazil, 83,973
Volterra, Italy, 11,166
Voorburg, Netherlands, 3,549
Vordingborg, Denmark, 11,780
Vorkuta, U.S.S.R., 65,000
Voronezh, U.S.S.R., 454,000
Voroshilov (Ussuriysk), U.S.S.R., 104,000
Voroshilovgrad (Lugansk), U.S.S.R., 274,000
Voroshilovsk (Kommunarsk), U.S.S.R., 98,000
Vorst (Forest), Belgium, 50,948
Votkinsk, U.S.S.R., 59,000
Voznesensk, U.S.S.R., 7,830
Voznesenskoye, U.S.S.R., 2,239
Vranje, Yugoslavia, 12,072
Vratsa, Bulgaria, 19,448
Vršac, Yugoslavia, 31,551
Vryburg, C. of G. Hope, 14,597
Vsetín, Czechoslovakia, 18,205
Vsevolozhskiy, U.S.S.R., 1,324
Vuadil', U.S.S.R., 5,232
Vukovar, Yugoslavia, 18,705
Vulcan, Alberta, 1,310
Vung Tau, S. Vietnam, 5,800

Vyatka (Kirov), U.S.S.R., 252,000
Vyaz'ma, U.S.S.R., 20,814
Vyborg, U.S.S.R., 51,000
Vyritsa, U.S.S.R., 2,920
Vyshniy Volochek, U.S.S.R., 66,000
Vytegra, U.S.S.R., 5,090

—W—

Wa, Ghana, 14,000
Wabash (river), U.S.
Wabowden, Manitoba, 327
Wąbrzeźno, Poland, 10,900
Waco, Tex., 97,808
Wad Medani, Sudan, 61,450
Waddington (mountain), Br. Col.
Wadena, Saskatchewan, 1,311
Wadhwan (Surendranagar), India, 21,622
Wadi Halfa, Sudan, 11,006
Wageningen, Netherlands, 21,305
Wager (bay), N.W. Terrs.
Wagga Wagga, Australia, 22,092
Wagin, Australia, 1,608
Wągrowiec, Poland, 12,100
Wahai, Indonesia, †8,781
Waihi, New Zealand, 3,164
Waikabubak, Indonesia
Waikerie, Australia, 909
Waingapu, Indonesia, 2,127
Wainwright, Alberta, 3,351
Wairoa, New Zealand, 4,303
Wajabula, Indonesia
Wakaw, Saskatchewan, 974
Wakayama, Japan, 285,155
Wake (island), Pacific, 349
Wakefield, England, 61,591
Wakkanai, Japan, 51,113
Wałbrzych (Waldenburg), Poland, 117,100
Wałcz, Poland, 15,700
Waldenburg (Wałbrzych), Poland, 117,100
Walgett, Australia, 1,726
Walker (lake), Nev.
Walkerton, Ontario, 3,851
Wallaceburg, Ontario, 7,881
Wallaroo, Australia, 2,237
Wallasey, England, 103,213
Wallis (islands), Pacific, 4,765
Wallsend, Australia, 2,687
Wallsend, England, 49,785
Walney (island), England
Walsall, England, 117,836
Walsrode, Germany, 13,008
Walvis Bay, C. of Good Hope, 12,165
Wandoan, Australia, 500
Wanganui, New Zealand, †35,694
Wangaratta, Australia, 13,784
Wangyehmiao (Ulanhot), China, 51,400
Wanhsien, China, 75,000
Wankie, S. Rhodesia, 9,901
Wanless, Manitoba, 156
Wanne-Eickel, Germany, 107,197
Wanstead and Woodford, England, 61,259
Warabi, Japan, 50,952
Warangal (Hanamkonda), India, 156,163
Waratah, Australia, 320
Warburton (river), Australia
Wardha, India, 28,359
Ware, Br. Columbia, 75
Waren, Germany, 19,807
Warmbad, S.W. Africa, 177
Warrenton, C. of G. Hope, 5,980
Warri, Nigeria, 10,726
Warrington, England, 75,533
Warrnambool, Australia, 15,702
Warsaw (Warszawa),* Poland, 1,136,000
Warta (Warthe) (river), Poland
Warwick, Australia, 9,843
Warwick, England, 16,032
Wasatch (mt. range), U.S.
Wash, The (bay), England
Washington, D.C.,* U.S., 763,956
Washington (island), Pacific, 158
Watampone, Indonesia, 2,515
Waterbury, Conn., 107,130
Waterford, Ireland, 28,138
Waterford (harbor), Ireland
Waterloo, Belg., 11,313
Waterloo, Iowa, 71,755
Waterloo, Ontario, 21,366
Waterton Lakes (park), Alberta, 344
Waterways, Alberta, 400
Wates, Indonesia, †33,514
Watford, England, 75,630
Watrous, Saskatchewan, 1,461
Watsa, R.o.t. Congo, 5,863
Watson, Saskatchewan, 910
Watson Lake, Yukon, 210
Wau, Sudan, 6,600
Wau, Terr. New Guinea, 1,865
Waveney (river), England
Waverley, Australia, 64,999
Weda, Indonesia
Wedau, Papua
Wedgeport, Nova Scotia, 698
Wednesbury, England, 34,511
Weida, Germany, 13,511
Weiden, Germany, 41,711
Weidenau, Germany, 17,231
Weifang, China, 148,900
Weihai, China, 45,000
Weilheim, Germany, 12,430
Weimar, Germany, 66,659
Weinheim, Germany, 27,859
Weissenfels, Germany, 50,995
Weissensee, Germany, 82,017
Wejh, Saudi Arabia, 2,000
Wejherowo, Poland, 23,300
Wekusko, Manitoba, 51
Welland, Ontario, 36,079
Wellesley (islands), Australia
Wellingborough, England, 30,579
Wellington, Australia, 5,599
Wellington, C. of G. Hope, 10,330
Wellington,* New Zealand, †150,544
Wellington (island), Chile
Wels, Austria, 41,060
Welwyn, England, 34,944
Wenchow, China, 201,600
Wenlock, England, 14,929
Wentworth, Australia, 1,154
Werdau, Germany, 27,041
Wernigerode, Germany, 33,800
Wesel, Germany, 32,002
Weser (river), Germany
Wesleyville, Newfoundland, 1,285
Wessel (cape), Australia
Wessel (islands), Australia
West Bromwich, England, 95,909
West Hartlepool, England, 77,073
Western Ghats (mt. range), India
Westlock, Alberta, 1,838
Weston-super-Mare, England, 43,923
Westport, New Zealand, 5,460
Westray (island), Scotland, 1,012
Westville, Nova Scotia, 4,159
Wetaskiwin, Alberta, 5,300
Wettingen, Switzerland, 17,613
Wetzlar, Germany, 37,277
Wewak, Terr. New Guinea, 879
Wexford, Ireland, 10,002
Wexford (harbor), Ireland
Weyburn, Saskatchewan, 9,101
Weymouth, Nova Scotia, 584
Weymouth-Melcombe Regis, England, 40,962
Whakatane, New Zealand, 7,167
Whale (river), Quebec
Whalsay (island), Scotland, 872
Whangarei, New Zealand, †21,790
Wharfe (river), England
Whitby, Ontario, 14,685
White (bay), Newf.
White (sea), U.S.S.R.
White Nile (river), Africa
White River, Ontario, 836
White Volta (river)
Whitecourt, Alberta, 1,054
Whitehaven, England, 27,541
Whitehorse,* Yukon, 5,031
Whitney, Ontario, 835
Whitney (mountain), Calif.
Whitstable, England, 19,534

Whitsunday (island), Australia
Whittlesea, Australia, 601
Whyalla, Australia, 13,711
Wiarton, Ontario, 2,138
Wichita, Kans., 254,698
Wichita Falls, Tex., 101,724
Wicklow (mt. range), Ireland
Wicklow Head (cape), Ireland
Widnes, England, 52,168
Wieliczka, Poland, 12,100
Wieluń, Poland, 11,300
Wien (Vienna),* Austria, 1,627,034
Wiener-Neustadt, Austria, 33,836
Wiesbaden, Germany, 253,280
Wigan, England, 78,702
Wight (island), England, 95,479
Wigston (Wigston Magna), England, 21,405
Wigtown (bay), Scotland
Wilberforce (cape), Australia
Wilcannia, Australia, 839
Wilhelmshaven, Germany, 100,202
Wilkes-Barre, Pa., 63,551
Wilkie, Saskatchewan, 1,612
Willemstad,* Neth. Antilles, 43,547
Williams, Australia, 490
Williams Lake Br. Columbia, 2,120
Williamstown, Australia, 647
Williamstown, Australia, 30,606
Willis (islets), Australia, 2
Willoughby, Australia, 53,683
Willow Bunch, Saskatchewan, 698
Willowmore, C. of G. Hope, 3,454
Wilmington, Australia, 377
Wilmington, Del., 95,827
Wilmslow, England, 21,393
Wilno (Vilna), U.S.S.R., 235,000
Wilson's (promontory), Australia
Wiluna, Australia, 158
Wimbledon, England, 56,994
Winchester, England, 28,643
Wind River (mt. range), Wyo.
Windhoek,* S.W. Africa, 35,916
Windorah, Australia, 99
Windsor, Newfoundland, 5,505
Windsor, Nova Scotia, 3,823
Windsor, Ontario, 114,367
Windsor, Greater, Ontario, 193,365
Windward (passage), W.I.
Wingham, Ontario, 2,922
Winkler, Manitoba, 2,529
Winnemucca (lake), Nev.
Winnipeg,* Manitoba, 265,429
Winnipeg, Greater, Manitoba, 475,989
Winnipeg (lake), Man.
Winnipegosis, Manitoba, 980
Winnipegosis (lake), Man.
Winston-Salem, N.C., 111,135
Winterthur, Switz., 80,352
Winton, Australia, 1,784
Wisbech, England, 17,512
Wismar, Germany, 42,018
Witham (river), England
Witten, Germany, 96,462
Wittenberg, Germany, 41,304
Wittenberge, Germany, 31,485
Włocławek, Poland, 61,800
Woking, England, 67,485
Wolfenbüttel, Germany, 38,060
Wolfsberg, Austria, 9,458
Wolfsburg, Ger., 64,576
Wolfville, Nova Scotia, 2,413
Wollaston (lake), Sask.
Wollongong, Australia, †131,754
Wołomin, Poland, 21,100
Wolseley, Saskatchewan, 1,031
Woluwe-Saint-Lambert, Belgium, 36,960
Woluwe-St.-Pierre, Belg., 30,829
Wolverhampton, England, 150,385
Wombwell, England, 18,701
Wonju, S. Korea, 20,429
Wonogiri, Indonesia, †45,704
Wonosobo, Indonesia, 33,917
Wonreli, Indonesia
Wŏnsan, N. Korea, 112,952
Wonthaggi, Australia, 4,190
Wood Buffalo (park), Canada
Woodridge, Manitoba, 327
Woods (lake), Australia
Woods (lake)
Woodstock, New Brunswick, 4,305
Woodstock, Ontario, 20,486
Woodville, Aust., 71,039
Wooramel (river), Australia
Worcester, C. of G. Hope, 32,301
Worcester, England, 65,865
Worcester, Mass., 186,587
Workington, England, 29,507
Worksop, England, 34,237
Worms, Germany, 62,392
Worthing, England, 80,143
Wosi, Indonesia
Wrangel (island), U.S.S.R.
Wrath (cape), Scotland
Wreck (reef), Australia
Wrexham, Wales, 35,427
Wrocław (Breslau), Poland, 429,200
Września, Poland, 13,300
Wuchang (incl. in Wuhan), China, 199,000
Wuchow, China, 110,800
Wuhan, China, 1,427,300
Wuhu, China, 242,100
Wukari, Nigeria, 7,869
Wun, India, 12,225
Wuppertal, Germany, 420,711
Würzburg, Germany, 116,883
Wurzen, Germany, 22,234
Wusih, China, 581,500
Wutungkiao, China, 199,100
Wuwei, China
Wyalong, Australia, 591
Wyandra, Australia, 160
Wye (river), England
Wyndham, Australia, 613
Wynyard, Australia, 3,121
Wynyard, Saskatchewan, 1,686
Wyoming (mt. range), Wyo.

X

Xánthē, Greece, 26,377
Xieng Khouang, Laos
Xingu (river), Brazil
Xochimilco, Mexico, 30,031

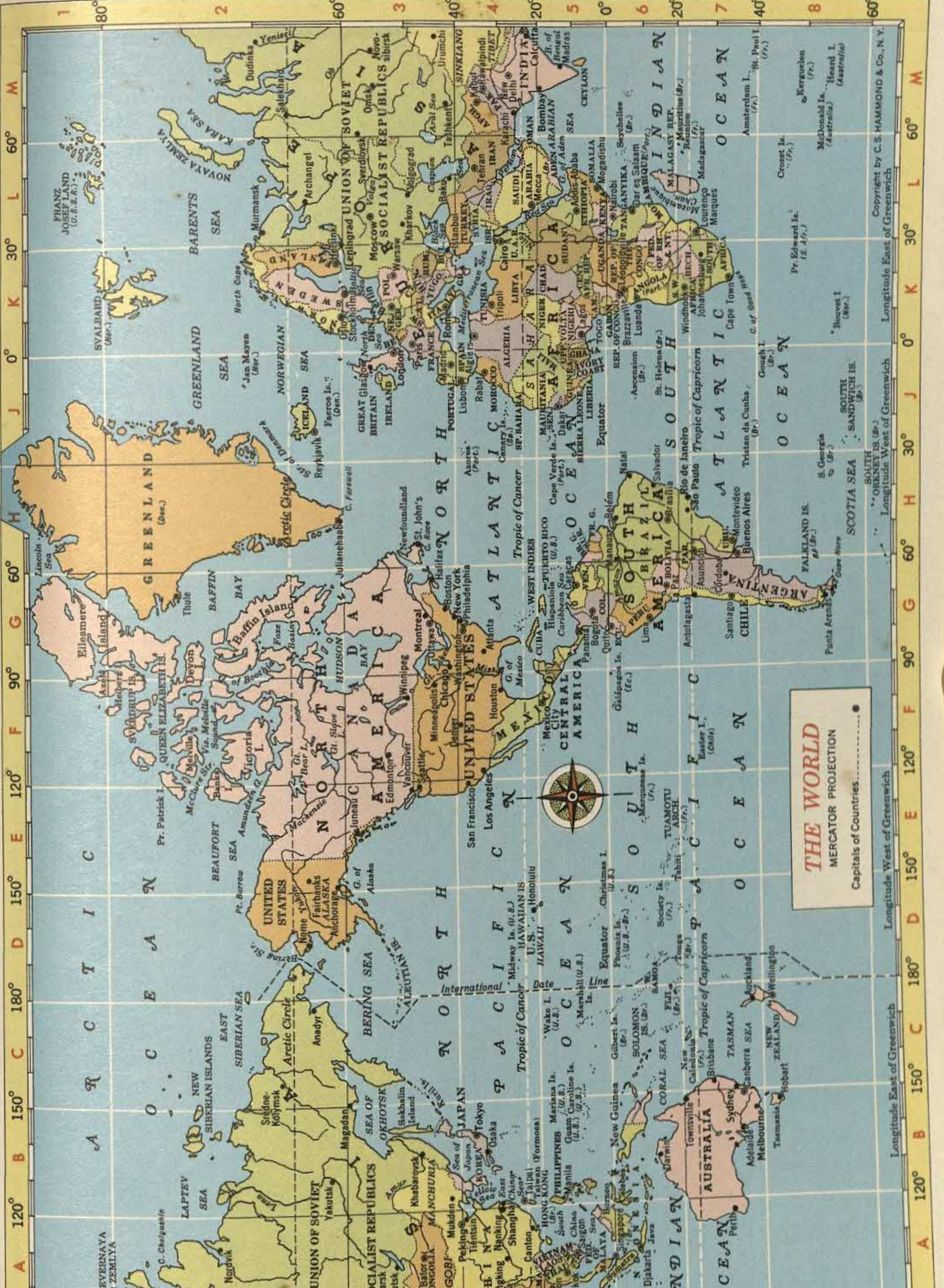
Y

Yaan, China, 55,200
Yaapeet, Australia, 146
Yablonovyy (mountains), U.S.S.R.
Yacuiba, Bolivia, 5,027
Yakutsk, U.S.S.R., 74,000
Yala, Thailand, 7,100
Yalgoo, Australia, 162
Yallourn, Aust., 5,010
Yalta, U.S.S.R., 28,838
Yalutorovsk, U.S.S.R.
Yamagata, Japan, 188,597
Yamaguchi, Japan, 87,695
Yamal (peninsula), U.S.S.R.
Yamatotakada, Japan, 31,240
Yambol, Bulgaria, 42,038
Yamethin, Burma, 10,126
Yampol', U.S.S.R., 3,431
Yanac, Australia, 92
Yangambi, R.o.t. Congo, 16,948
Yangchow, China, 180,200
Yangchüan, China, 177,400
Yangi-Kurgan, U.S.S.R., 2,481
Yangi-Yul', U.S.S.R., 30,000
Yangtze Kiang (river), China
Yao, Japan, 122,832
Yaoundé,* Cameroon, 57,750
Yap (islands), Pacific, 2,700
Yaraka, Australia, 87
Yare (river), England
Yariga (mountain), Japan
Yarim, Yemen, 5,000
Yarkand, China, 80,000
Yarkovo, U.S.S.R., 741

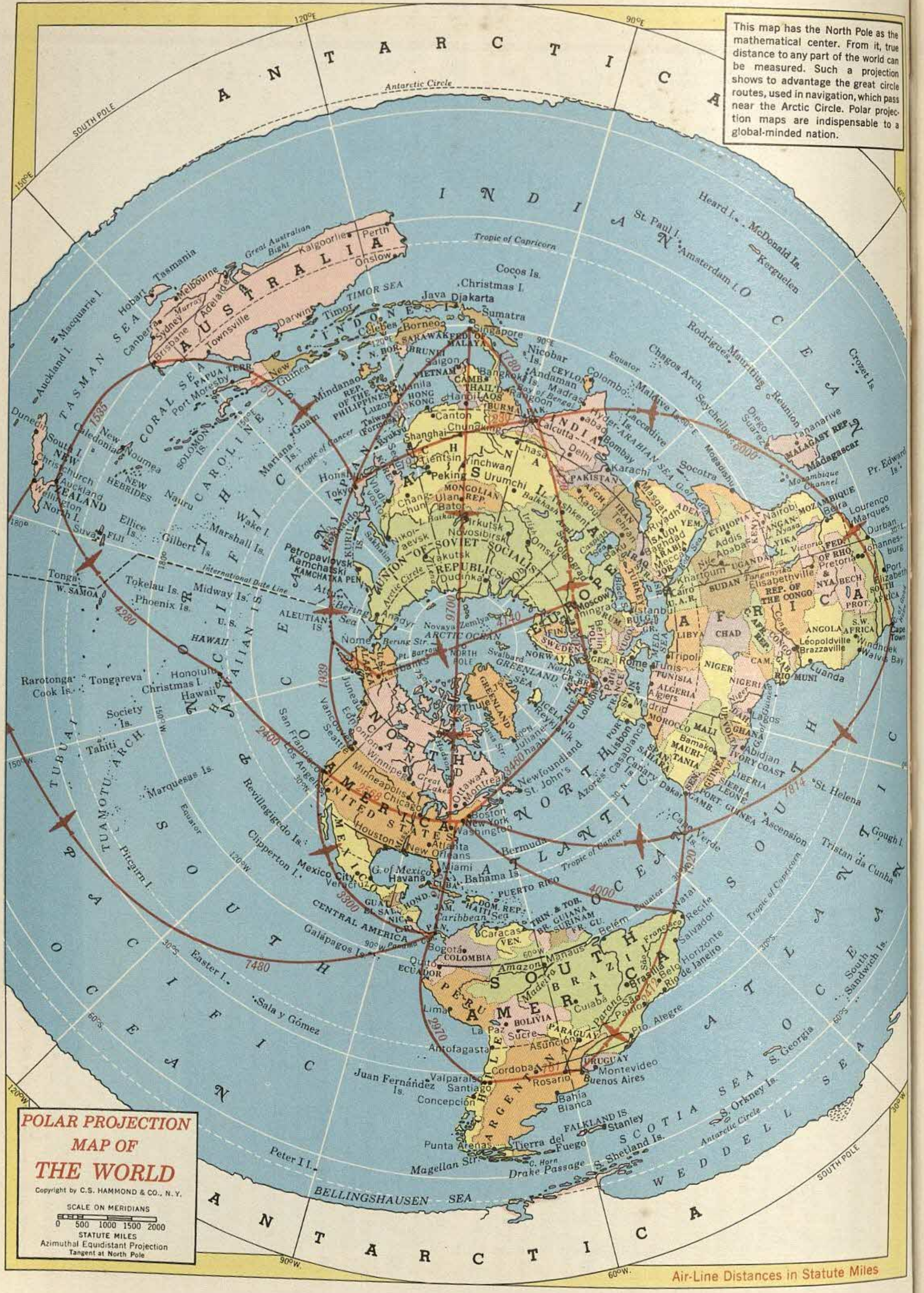
Yarmouth, Nova Scotia, 8,636.......
Yaroslavl', U.S.S.R., 406,000.........
Yartsevo, U.S.S.R., 18,703...........
Yarumal, Colombia, 8,693.............
Yass, Australia, 3,909...................
Yathkyed (lake), N.W. Terrs. ......
Yatsushiro, Japan, 90,303.............
Yauco, Puerto Rico, 8,996.............
Yavne, Israel, 5,397......................
Yavneel, Israel, 1,550....................
Yawatahama, Japan, 52,527.........
Yaya, U.S.S.R. ....
Ye, Burma ....
Yecla, Spain, †20,999....................
Yegor'yevsk, U.S.S.R., 59,000.......
Yehud, Israel, 6,750.......................
Yelan', U.S.S.R., 13,273................
Yelets, U.S.S.R., 78,000.................
Yelgava (Jelgava), U.S.S.R., 34,099 ....
Yell (island), Scotland, 1,152......
Yellamanchili, India, 9,054............
Yellandlapad, India, 15,907..........
Yellow (Hwang Ho) (river), China ....
Yellow (sea) ....
Yellow Grass, Saskatchewan, 527 ....
Yellowknife, N.W. Terrs., 3,245 ....
Yellowstone (river), U.S. ....
Yen Bay, N. Vietnam ....
Yenakiyevo, U.S.S.R., 92,000........
Yenangyaung, Burma ....
Yenbo, Saudi Arabia, 10,000.........
Yendi, Ghana, 16,000....................
Yenişehir, Turkey, 10,739.............
Yenisey (river), U.S.S.R. ....
Yeniseysk, U.S.S.R. ....
Yenki, China, 70,000.....................
Yenotayevka, U.S.S.R., 3,798.........
Yeola, India, 17,817.......................
Yeotmal, India, 26,555..................
Yeovil, England, 24,552.................
Yerevan (Erivan), U.S.S.R., 509,000 ....
Yerwa, Nigeria, 54,646..................
Yezd, Iran, 63,502.........................
Yinchwan, China, 84,000...............
Yingkow, China, 131,400...............
Yoichi, Japan, 28,659....................
Yokkaichi, Japan, 195,974..............
Yokohama, Japan, 1,375,710..........
Yokosuka, Japan, 287,309..............
Yola, Nigeria, 5,310.......................
Yonago, Japan, 94,808...................
Yonezawa, Japan, 96,991...............
Yŏngch'ŏn, S. Korea, 39,192.........
Yŏngju, S. Korea, 32,409...............
Yono, Japan, 35,162.......................
York, Australia, 1,524 ....
York, England, 104,468 ....
York (cape), Australia ....
York (sound), Australia ....
Yorkton, Saskatchewan, 9,995.......
Yoshkar-Ola, U.S.S.R., 88,000........
Youghal (bay), Ireland ....
Young, Australia, 5,448.................
Youngstown, Alberta, 321 ....
Youngstown, Ohio, 166,689 ....
Yoyang, China, 4,800......................
Yozgat, Turkey, 18,263..................
Ypres (Ieper), Belg., 18,134..........
Ystad, Sweden, 13,749..................
Yubari, Japan, 107,972..................
Yucatán (channel) ....
Yucatán (peninsula), Mexico.........
Yukon (river), N. Amer. ....
Yule (river), Australia..................
Yülin, China ....
Yümen, China ....
Yuna, Australia, 140......................
Yungkia (Wenchow), China, 201,600 ....
Yuzhno-Kuril'sk, U.S.S.R. ....
Yuzhno-Sakhalinsk, U.S.S.R., 86,000 ....
Yverdon, Switzerland, 16,338.......

Z

Zaandam, Netherlands, 46,814.....
Zabid, Yemen, 8,000 ....
Ząbkowice Śląskie, Poland, 10,700 ....
Zabrze (Hindenburg), Poland, 188,800 ....
Zabul (Nasratabad), Iran, 12,221 ....
Zacapa, Guatemala, 8,260............
Zacatecas, Mexico, 31,851............
Zacatecoluca, El Salvador, 11,173 ....
Zacatelco, Mexico, 15,307 ....
Zadar (Zara), Yugoslavia, 16,146 ....
Zagań, Poland, 17,300...................
Zagreb, Yugoslavia, 427,319.........
Zahle, Lebanon, 25,153.................
Zaječar, Yugoslavia, 14,489...........
Zakopane, Poland, 25,200.............
Zákynthos, Greece, 9,506.............
Zalaegerszeg, Hungary, 23,738.....
Zălău, Rumania, 13,378...............
Zalesovo, U.S.S.R., 2,379..............
Zambezi (river), Africa................
Zamboanga, Philippine Is., 131,411 ....
Zamora, Mexico, 31,991 ....
Zamora, Spain, †42,060 ....
Zamość, Poland, 28,000................
Zante (Zákynthos) (isl.), Greece, 35,499 ....
Zanzibar,* Zanzibar, 57,923........
Zapala, Argentina, 3,387...............
Zaporozh'ye, U.S.S.R., 435,000.....
Zara, Turkey, 7,351 ....
Zara (Zadar), Yugoslavia, 16,146 ....
Zaragoza (Saragossa), Spain, †326,316 ....
Zárate, Arg., 12,692......................
Zaria, Nigeria, 54,000....................
Żary, Poland, 23,100......................
Žatec, Czechoslovakia, 14,775........
Zavitaya, U.S.S.R. ....
Zav'yalovo, U.S.S.R., 3,217............
Zawiercie, Poland, 32,600..............
Zaysan, U.S.S.R., 8,245.................
Zduńska Wola, Poland, 24,800......
Zeballos, Br. Columbia, 235..........
Zeehan, Australia, 780..................
Zegharta, Lebanon, 9,553.............
Zehdenick, Germany, 13,246.........
Zeila, Somali Rep., 5,000..............
Zeist, Netherlands, 41,937.............
Zeitz, Germany, 39,581.................
Zelenodol'sk, U.S.S.R., 60,000 ......
Zelenogorsk, U.S.S.R. ....
Zella-Mehlis, Germany, 17,352.......
Zelten (mts.), Libya.....................
Zenica, Yugoslavia, 33,271............
Zenjan, Iran, 47,159......................
Zerbst, Germany, 19,237...............
Zermatt, Switz., 2,731...................
Zeulenroda, Germany, 14,039........
Zgierz, Poland, 34,500...................
Zhdanov, U.S.S.R., 284,000............
Zherdevka, U.S.S.R., 574...............
Zhitomir, U.S.S.R., 105,000...........
Zielona Góra (Grünberg), Poland, 48,000 ....
Ziguinchor, Senegal, 29,840..........
Zikhron Ya'aqov, Israel, 4,700......
Zilair, U.S.S.R., 5,624...................
Zile, Turkey, 21,436......................
Žilina, Czechoslovakia, 32,512........
Zima, U.S.S.R., 15,100..................
Zimbabwe (ruins), S. Rhod. ....
Zimnicea, Rumania, 12,445............
Zimovniki, U.S.S.R., 2,885............
Zinder, Niger, 14,891....................
Zitácuaro, Mexico, 23,410.............
Zittau, Germany, 45,084...............
Zlatoust, U.S.S.R., 151,000...........
Zlín (Gottwaldov), Czech., 54,189 ....
Zliten, Libya, †21,033...................
Znojmo (Znaim), Czechoslovakia, 23,956 ....
Zomba,* Nyasaland, 4,111............
Zonguldak, Turkey, 54,026............
Zoppot (Sopot), Poland, 44,500....
Zrenjanin (Vel. Bečkerek), Yugoslavia, 48,956 ....
Zug, Switzerland, 19,792..............
Zürich, Switzerland, 440,170........
Zushi, Japan, 35,908.....................
Zutphen, Netherlands, 24,220.......
Zverevo, U.S.S.R., 2,388...............
Zverinogolovskoye, U.S.S.R., 5,133 ....
Zvolen, Czechoslovakia, 19,608......
Zwara, Libya, 10,816....................
Zweibrücken, Germany, 32,924......
Zwickau, Germany, 129,953...........
Zwolle, Netherlands, 54,087..........
Żyrardów, Poland, 27,700.............
Zyryanovsk, U.S.S.R., 54,000........
Żywiec, Poland, 18,200 ....


THE WORLD
MERCATOR PROJECTION
Capitals of Countries
Copyright by C.S. HAMMOND & Co., N.Y.
Longitude East of Greenwich
Longitude West of Greenwich
ARCTIC OCEAN
NORTH PACIFIC OCEAN
SOUTH PACIFIC OCEAN
NORTH ATLANTIC OCEAN
SOUTH ATLANTIC OCEAN
INDIAN OCEAN
NORTH AMERICA
SOUTH AMERICA
CENTRAL AMERICA
AFRICA
AUSTRALIA
UNION OF SOVIET SOCIALIST REPUBLICS
CANADA
UNITED STATES
GREENLAND (Den.)
BRAZIL
ARGENTINA
CHINA
INDIA
Arctic Circle
Tropic of Cancer
Equator
Tropic of Capricorn
International Date Line
BERING SEA
SEA OF OKHOTSK
BARENTS SEA
KARA SEA
LAPTEV SEA
EAST SIBERIAN SEA
BEAUFORT SEA
BAFFIN BAY
HUDSON BAY
GREENLAND SEA
NORWEGIAN SEA
ARABIAN SEA
CORAL SEA
TASMAN SEA
SCOTIA SEA
HAWAIIAN IS.
NEW ZEALAND
JAPAN
MEXICO
ICELAND
GREAT BRITAIN
FRANCE
SPAIN
ALASKA
SAHARA
0° 30° 60° 90° 120° 150° 180°
80° 60° 40° 20° 0° 20° 40° 60°
A B C D E F G H J K L M
1 2 3 4 5 6 7 8

2 — WORLD—POLAR PROJECTION



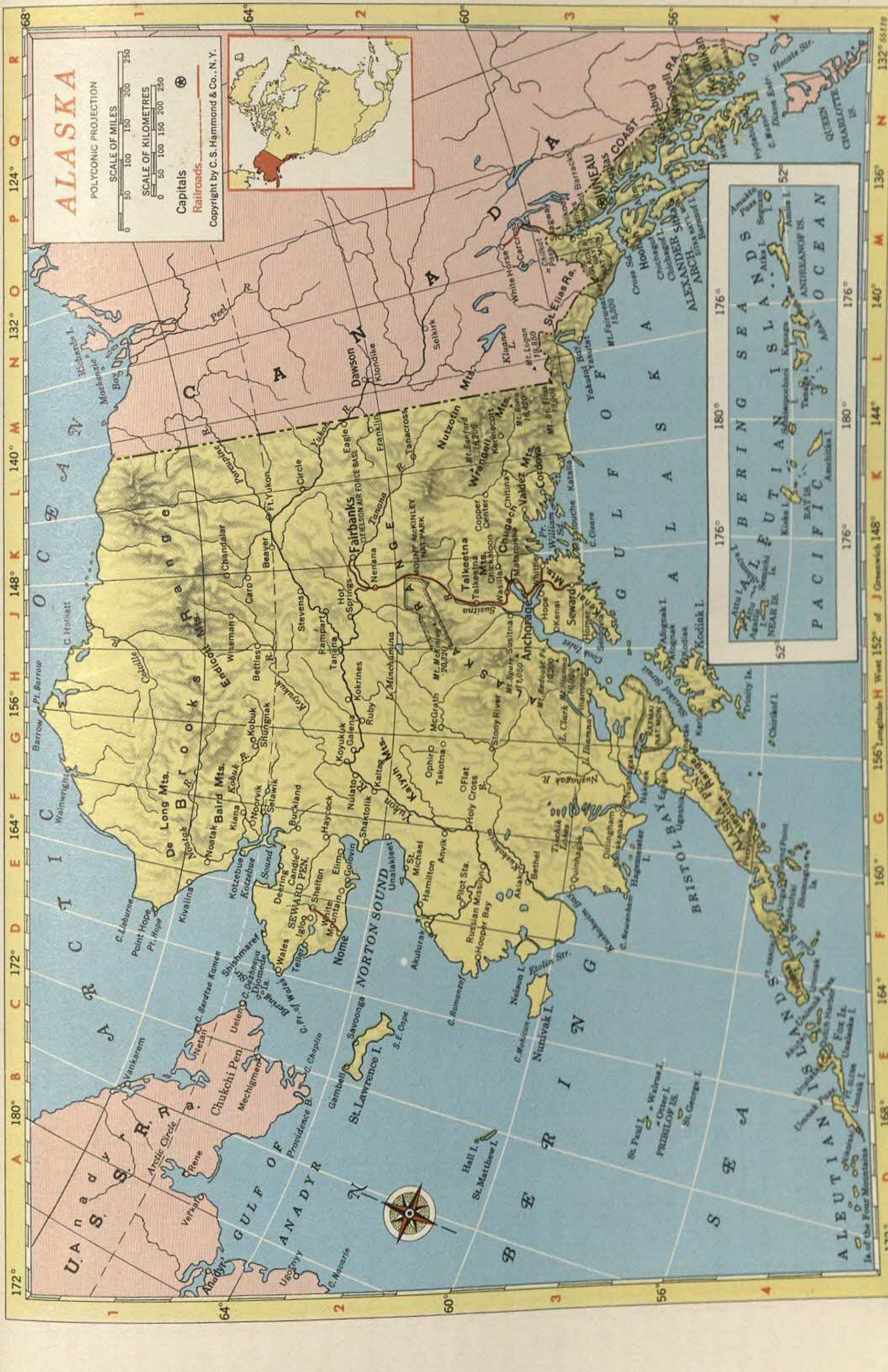
This map has the North Pole as the mathematical center. From it, true distance to any part of the world can be measured. Such a projection shows to advantage the great circle routes, used in navigation, which pass near the Arctic Circle. Polar projection maps are indispensable to a global-minded nation.

POLAR PROJECTION
MAP OF
THE WORLD

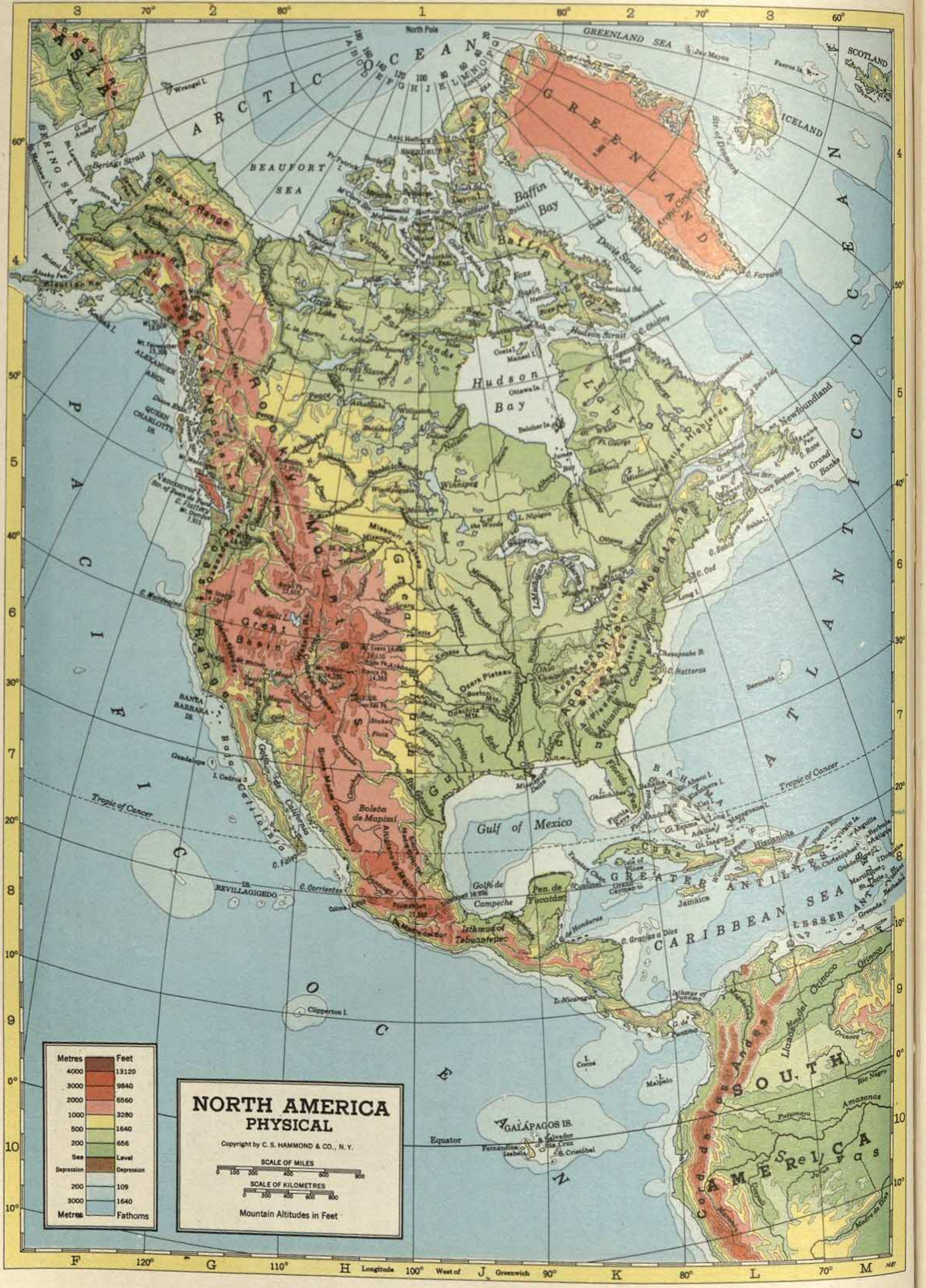
Copyright by C.S. HAMMOND & CO., N.Y.

SCALE ON MERIDIANS
0 500 1000 1500 2000
STATUTE MILES
Azimuthal Equidistant Projection
Tangent at North Pole

Air-Line Distances in Statute Miles


ALASKA
POLYCONIC PROJECTION
SCALE OF MILES
0 50 100 150 200 250
SCALE OF KILOMETRES
0 50 100 150 200 250
Capitals
Railroads
Copyright by C.S. Hammond & Co., N.Y.
ARCTIC OCEAN
CANADA
U.S.S.R.
Brooks Range
Alaska Range
BERING SEA
GULF OF ALASKA
GULF OF ANADYR
NORTON SOUND
BRISTOL BAY
ALEUTIAN ISLANDS
BERING SEA
ALEUTIAN ISLANDS
PACIFIC OCEAN
Fairbanks
Anchorage
JUNEAU
Nome
Barrow
Kotzebue
Dawson
Whitehorse
Mt. McKinley 20,320
Seward
Kodiak I.
St. Lawrence I.
Nunivak I.
Arctic Circle

4 — NORTH AMERICA—PHYSICAL



NORTH AMERICA
PHYSICAL

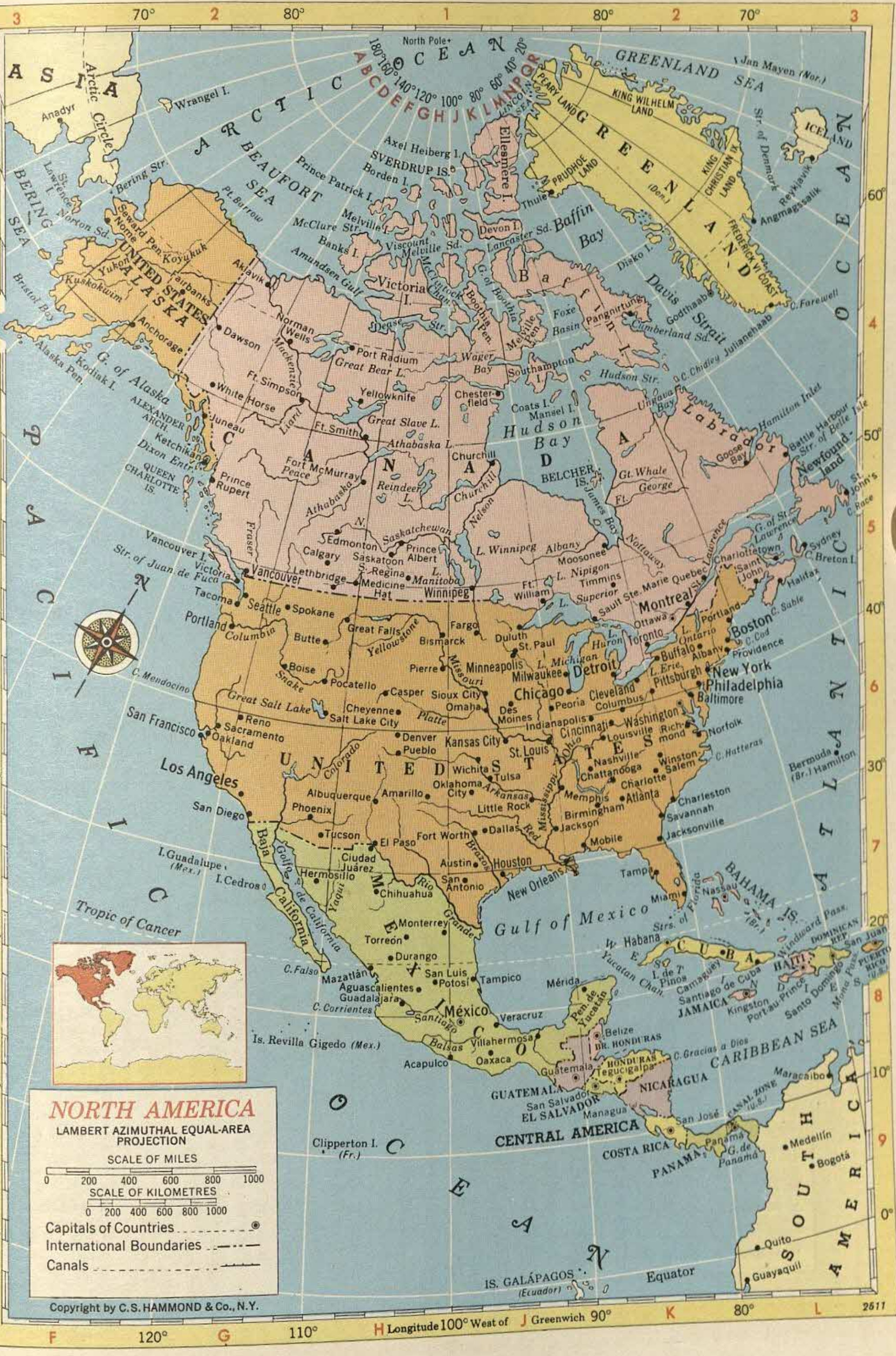
Copyright by C. S. HAMMOND & CO., N. Y.

SCALE OF MILES
0 100 200 400 600 800

SCALE OF KILOMETRES
0 200 400 600 800

Mountain Altitudes in Feet

Metres		Feet
4000	🟫	13120
3000	🟥	9840
2000	🟥	6560
1000	🟨	3280
500	🟩	1640
200	🟩	656
Sea	🟩	Level
Depression	🟫	Depression
200	🟦	109
3000	🟦	1640
Metres		Fathoms



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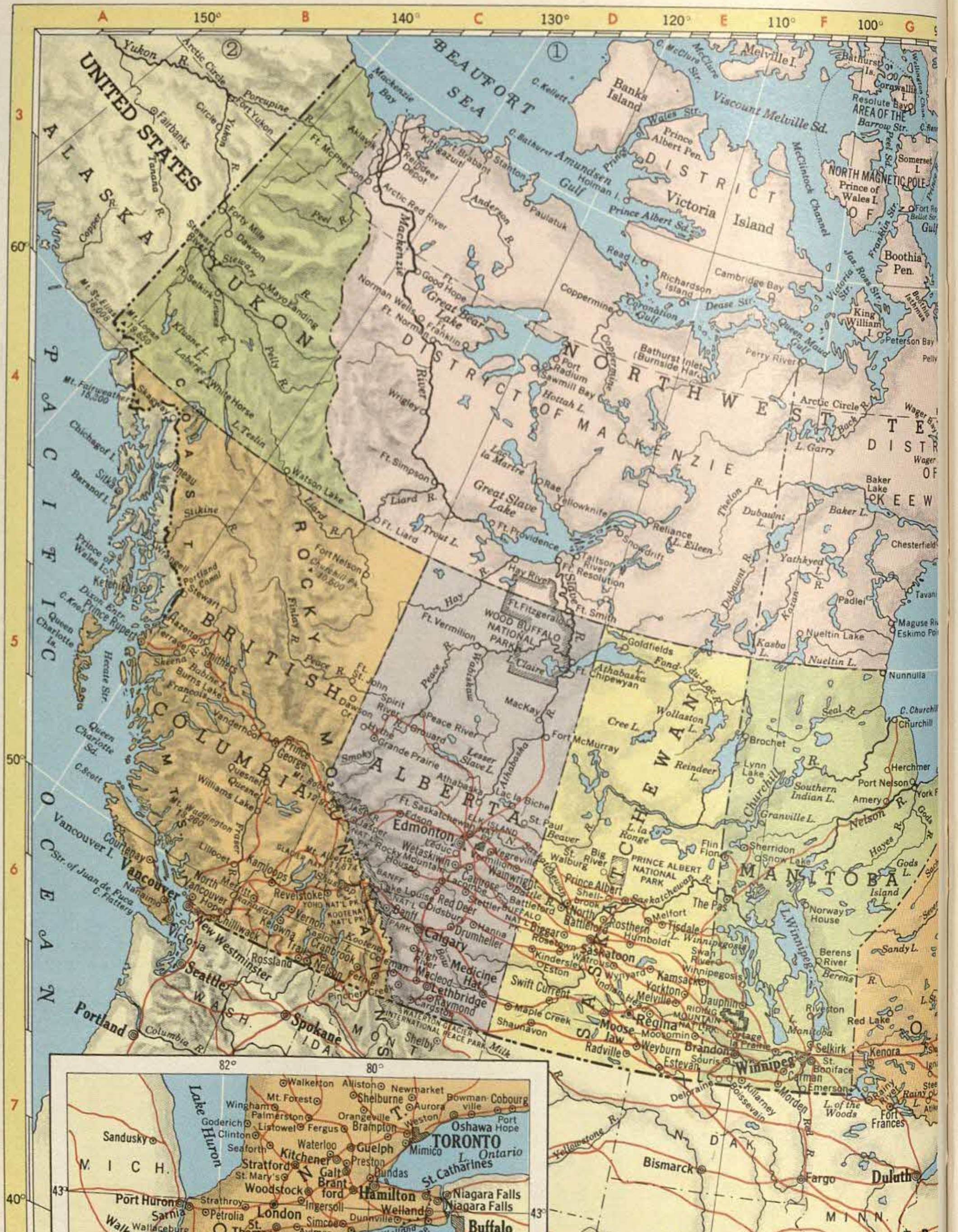
6 — CANADA



A
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140°
130°
120°
110°
100°
60°
50°
40°
3
4
5
6
7
8
120°
110°
100°
Longitude
UNITED STATES
ALASKA
PACIFIC OCEAN
BEAUFORT SEA
YUKON
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
NORTHWEST
DISTRICT OF MACKENZIE
DISTRICT OF KEEWATIN
DISTRICT
ROCKY MOUNTAINS
COAST MTS.
Arctic Circle
Fairbanks
Tanana R.
Copper R.
Yukon R.
Porcupine
Ft. Yukon
Circle
Ft. McPherson
Aklavik
Reindeer Depot
Kittigazuit
Ft. Brabant
Stanton
Mackenzie Bay
Arctic Red River
Peel R.
Forty Mile
Dawson
Stewart
Stewart River
Ft. Selkirk
Mayo Landing
Pelly R.
Lewes R.
Kluane L.
L. Laberge
White Horse
L. Teslin
Watson Lake
Liard R.
Mt. St. Elias 18,008
Mt. Logan 19,850
Mt. Fairweather 15,300
Skagway
Juneau
Chichagof I.
Baranof I.
Sitka
Stikine R.
Wrangell
Prince of Wales I.
Ketchikan
Portland Canal
Stewart
Dixon Entr.
Prince Rupert
Queen Charlotte Is.
Hecate Str.
Queen Charlotte Sd.
C. Knox
C. Scott
Vancouver I.
Str. of Juan de Fuca
C. Flattery
Courtenay
Nanaimo
Vancouver
North Vancouver
New Westminster
Victoria
Seattle
WASH.
Portland
Columbia R.
Spokane
IDA.
MONT.
Shelby
Milk R.
Hazelton
Terrace
Skeena R.
Smithers
Babine L.
Burns Lake
François L.
Vanderhoof
Prince George
Quesnel
Quesnel L.
Williams Lake
Mt. Waddington 13,260
Mt. Robson 12,972
Lillooet
Fraser R.
Kamloops
Hope
Chilliwack
Merritt
Revelstoke
Vernon
Kelowna
Kaslo
Trail
Rossland
Nelson
Cranbrook
Fernie
Kootenay
Okanagan
Glacier Nat'l Pk.
Yoho Nat'l Pk.
Kootenay Nat'l Pk.
Mt. Alberta 11,874
Fort Nelson
Churchill Pk. 10,500
Finlay R.
Peace R.
Ft. St. John
Dawson Cr.
Spirit River
Hythe
Grande Prairie
Smoky R.
Grouard
Peace River
Lesser Slave L.
Athabaska
Athabaska R.
Lac la Biche
Ft. Saskatchewan
Edmonton
Edson
Jasper Nat'l Pk.
Rocky Mountain House
Wetaskiwin
Leduc
Camrose
Lacombe
Red Deer
Didsbury
Banff
Banff Nat'l Pk.
Lake Louise
Calgary
Drumheller
Hanna
High River
Macleod
Medicine Hat
Lethbridge
Pincher Creek
Cardston
Raymond
Waterton Glacier International Peace Park
Vegreville
Wainwright
Stettler
Battle R.
Buffalo Nat'l Pk.
St. Paul
Beaver R.
Ft. Vermilion
Hay R.
Wabiskaw R.
MacKay
Fort McMurray
Ft. Chipewyan
Ft. Fitzgerald
Wood Buffalo National Park
L. Claire
Ft. Smith
Slave R.
Hay River
Ft. Resolution
Taltson River
Ft. Providence
Great Slave Lake
Yellowknife
Rae
Lac la Martre
Snowdrift
Reliance
L. Eileen
Ft. Simpson
Ft. Liard
Liard R.
Trout L.
Wrigley
Mackenzie River
Ft. Norman
Norman Wells
Franklin
Ft. Good Hope
Great Bear Lake
Port Radium
Sawmill Bay
Hottah L.
Coppermine
Coppermine R.
Coronation Gulf
Bathurst Inlet (Burnside Har.)
Perry River
Queen Maud Gulf
Cambridge Bay
Dease Str.
Richardson Island
Read I.
Paulatuk
Anderson R.
Amundsen Gulf
C. Bathurst
C. Kellett
Banks Island
C. McClure
McClure Str.
Melville I.
Viscount Melville Sd.
Prince of Wales Str.
Prince Albert Pen.
Holman I.
Victoria Island
Prince Albert Sd.
McClintock Channel
Bathurst Is.
Cornwallis I.
Resolute Bay
AREA OF THE
Barrow Str.
Peel Sd.
Somerset I.
NORTH MAGNETIC POLE
Prince of Wales I.
Franklin Str.
Fort Ross
Bellot Str.
Gulf
Boothia Pen.
Boothia Isthmus
Jas. Ross Str.
Victoria Str.
King William I.
Peterson Bay
Pelly
Arctic Circle
Back R.
L. Garry
Wager Bay
Wager
Thelon R.
Baker Lake
Baker L.
Dubawnt L.
Dubawnt R.
Kazan R.
Yathkyed L.
Chesterfield
Padlei
Tavani
Maguse Riv.
Eskimo Pt.
Kasba L.
Nueltin Lake
Nueltin L.
Nunnulla
Goldfields
L. Athabaska
Fond-du-Lac R.
Wollaston L.
Cree L.
Reindeer L.
Brochet
Lynn Lake
Southern Indian L.
Churchill R.
Granville L.
Seal R.
C. Churchill
Churchill
Herchmer
Port Nelson
Amery
York F.
Nelson R.
Hayes R.
Gods L.
Gods R.
Island L.
L. la Ronge
Flin Flon
Sherridon
Snow Lake
Big River
Prince Albert National Park
Prince Albert
Shellbrook
Saskatchewan R.
The Pas
Melfort
Tisdale
Rosthern
Humboldt
L. Winnipegosis
Swan River
Winnipegosis
Norway House
Berens River
Berens R.
L. Winnipeg
Sandy L.
Red Lake
Kenora
Rainy L.
Rainy River
Fort Frances
L. of the Woods
St. Walburg
North Battleford
Biggar
Rosetown
Kindersley
Eston
Watrous
Saskatoon
Wynyard
Kamsack
Yorkton
Melville
Dauphin
Riding Mountain Nat'l Pk.
Swift Current
Maple Creek
Shaunavon
Moose Jaw
Regina
Moosomin
Qu'Appelle R.
Weyburn
Radville
Estevan
Souris
Brandon
Portage la Prairie
Winnipeg
Selkirk
St. Boniface
Carman
Morden
Emerson
Manitoba
Riverton
Deloraine
Killarney
Boissevain
Red R.
N. DAK.
Bismarck
Fargo
Yellowstone R.
MINN.
Duluth
Minneapolis
St. Paul
Mississippi R.
S. DAK.
Pierre
Missouri R.
Dakota R.
Niobrara R.
NEBR.
IOWA
UNITED STATES
82°
80°
43°
Lake Huron
MICH.
Sandusky
Walkerton
Alliston
Newmarket
Mt. Forest
Shelburne
Aurora
Bowmanville
Cobourg
Wingham
Palmerston
Orangeville
Goderich
Listowel
Fergus
Brampton
Weston
Oshawa
Port Hope
Clinton
Seaforth
Waterloo
Guelph
Kitchener
Preston
Mimico
TORONTO
Lake Ontario
Stratford
St. Mary's
Galt
Brantford
Dundas
St. Catharines
Woodstock
Hamilton
Niagara Falls
Niagara Falls
Welland
Port Huron
Sarnia
Strathroy
Petrolia
London
Ingersoll
Simcoe
Dunnville
St. Thomas
Aylmer
Port Dover
Welland Can.
Port Colborne
Buffalo
N. Y.
Walkerville
Wallaceburg
Dresden
DETROIT
L. St. Clair
Ridgetown
Chatham
Windsor
Sandwich
Tilbury
Essex
Amherstburg
Leamington
Kingsville
Pt. Pelee
Long Pt.
LAKE ERIE
Erie
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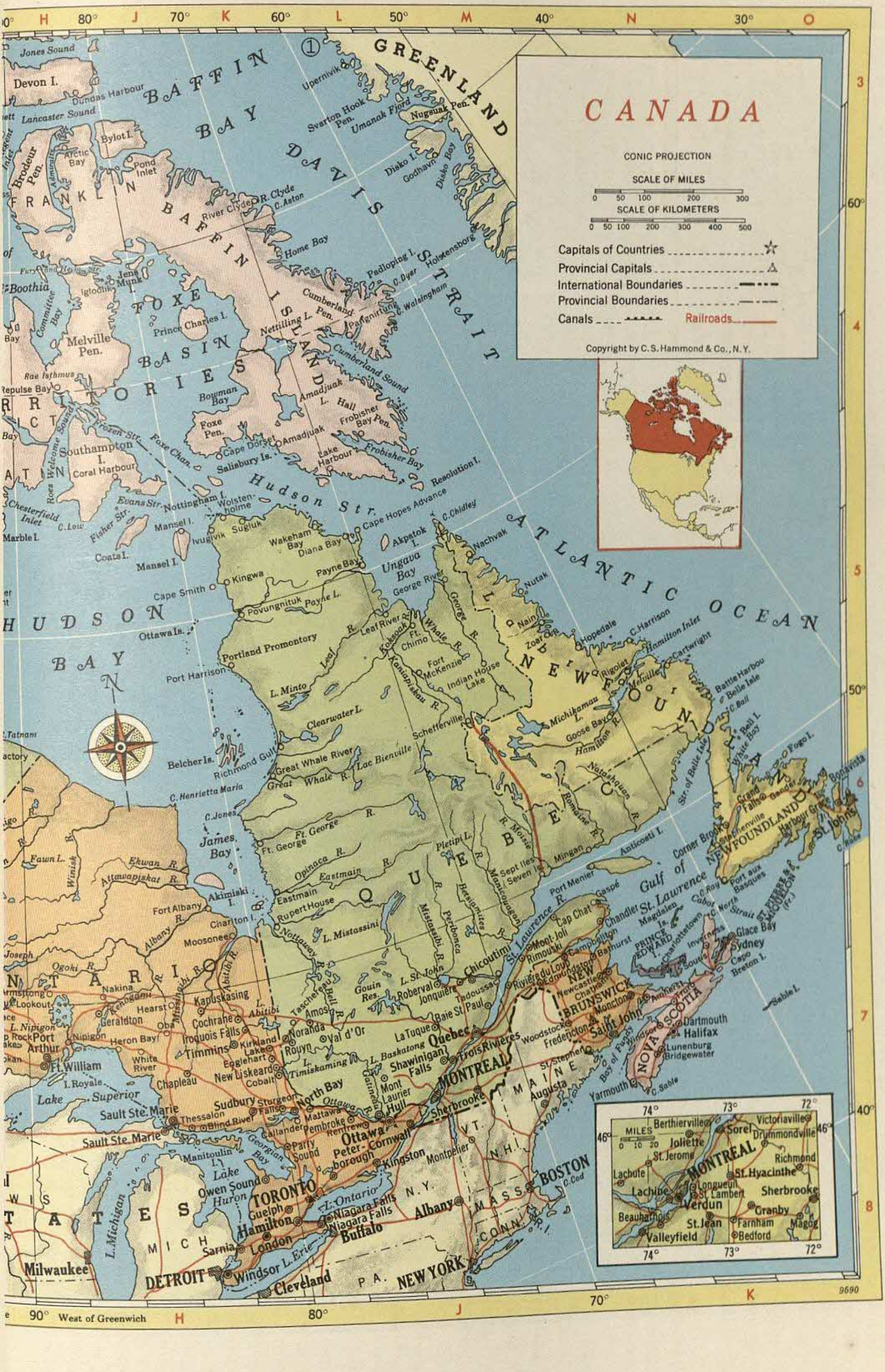
CANADA
CONIC PROJECTION
SCALE OF MILES
0 50 100 200 300
SCALE OF KILOMETERS
0 50 100 200 300 400 500
Capitals of Countries ☆
Provincial Capitals
International Boundaries
Provincial Boundaries
Canals
Railroads
Copyright by C. S. Hammond & Co., N.Y.
H
80°
J
70°
K
60°
L
50°
M
40°
N
30°
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60°
50°
40°
①
Jones Sound
Devon I.
Dundas Harbour
Lancaster Sound
Bylot I.
Arctic Bay
Brodeur Pen.
Pond Inlet
FRANKLIN
BAFFIN BAY
GREENLAND
Upernivik
Svarton Hook Pen.
Umanak Fjord
Nugsuak Pen.
Disko I.
Godhavn
Disko Bay
Holstensborg
DAVIS STRAIT
R. Clyde
River Clyde
C. Aston
BAFFIN ISLAND
Home Bay
Padloping I.
C. Dyer
C. Walsingham
Cumberland Pen.
Pangnirtung
Cumberland Sound
Nettilling L.
Amadjuak L.
Hall
Frobisher Bay Pen.
Frobisher Bay
Lake Harbour
Resolution I.
Amadjuak
Cape Dorset
Salisbury Is.
Igloolik
Jens Munk I.
Boothia
Committee Bay
Melville Pen.
Rae Isthmus
Repulse Bay
FOXE BASIN
Prince Charles I.
Bowman Bay
Foxe Pen.
TERRITORIES
Frozen Str.
Foxe Chan.
Southampton I.
Coral Harbour
Welcome Sound
Roes Welcome
Chesterfield Inlet
Evans Str.
Nottingham I.
Wolstenholme
Fisher Str.
C. Low
Marble I.
Mansel I.
Coats I.
Hudson Str.
Ivugivik
Sugluk
Wakeham Bay
Diana Bay
Cape Hopes Advance
C. Chidley
Akpatok I.
Ungava Bay
Payne Bay
Payne L.
George River
Kingwa
Cape Smith
Povungnituk
Nachvak
Nutak
ATLANTIC OCEAN
HUDSON BAY
Ottawa Is.
Portland Promontory
Leaf River
Leaf R.
Koksoak
Ft. Chimo
Whale R.
George R.
Fort McKenzie
Indian House Lake
Port Harrison
L. Minto
Kaniapiskau R.
Nain
Zoar
Hopedale
C. Harrison
Hamilton Inlet
Rigolet
Cartwright
Melville L.
NEWFOUNDLAND
Battle Harbour
Belle Isle
C. Bauld
Clearwater L.
Schefferville
Michikamau L.
Goose Bay
Hamilton R.
Belcher Is.
Richmond Gulf
Great Whale River
Great Whale R.
Lac Bienville
Str. of Belle Isle
White Bay
Bell I.
Fogo I.
C. Henrietta Maria
Natashquan R.
Romaine R.
Grand Falls
Gander
Stephenville
Harbour Grace
Bonavista
St. John's
C. Race
C. Jones
James Bay
Ft. George
Ft. George R.
Opinaca R.
Eastmain R.
Eastmain
Pletipi L.
QUEBEC
Moisie R.
Sept Iles (Seven Is.)
Mingan
Anticosti I.
Corner Brook
Port aux Basques
ST. PIERRE & MIQUELON (Fr.)
Fawn L.
Winisk
Ekwan R.
Attawapiskat R.
Akimiski I.
Fort Albany
Albany R.
Charlton I.
Rupert House
Moosonee
L. Mistassini
Mistassini R.
Peribonca R.
Bersimis R.
Manicouagan R.
Port Menier
Gaspé
Gulf of St. Lawrence
Cap Chat
Chandler
Magdalen Is.
C. Ray
Cabot Strait
C. North
Glace Bay
Sydney
Cape Breton I.
Inverness
Nottaway R.
Joseph
Ogoki R.
ONTARIO
Nakina
Armstrong
Lookout
Kenogami
Hearst
Kapuskasing
Abitibi R.
Missinaibi R.
Moose R.
L. Abitibi
Taschereau
Bell R.
Amos
Gouin Res.
L. St. John
Roberval
Chicoutimi
Jonquière
Tadoussac
Mont-Joli
Rimouski
St. Lawrence R.
Rivière du Loup
Edmundston
Campbellton
Bathurst
PRINCE EDWARD I.
Charlottetown
Souris
Truro
Sable I.
L. Nipigon
Nipigon
Geraldton
Oba
Cochrane
Iroquois Falls
Noranda
Val d'Or
Baie St. Paul
NEW BRUNSWICK
Newcastle
Chatham
Moncton
Amherst
NOVA SCOTIA
Dartmouth
Halifax
Lunenburg
Bridgewater
Port Arthur
Ft. William
Heron Bay
White River
Timmins
Kirkland Lake
Englehart
Rouyn
La Tuque
Quebec
L. Baskatong
Shawinigan Falls
Trois Rivieres
Woodstock
Fredericton
Saint John
Bay of Fundy
Windsor
I. Royale
Lake Superior
Chapleau
New Liskeard
Cobalt
L. Timiskaming
Gatineau R.
Mont Laurier
MONTREAL
St. Stephen
MAINE
Augusta
Yarmouth
C. Sable
Sault Ste. Marie
Thessalon
Blind River
Sudbury
Sturgeon Falls
North Bay
Ottawa R.
Mattawa
Callander
Pembroke
Renfrew
Hull
Sherbrooke
Ottawa
Cornwall
Peterborough
Kingston
Parry Sound
Georgian Bay
Manitoulin I.
Lake Huron
Owen Sound
VT.
Montpelier
N.H.
BOSTON
C. Cod
MASS.
N.Y.
Albany
CONN.
R.I.
TORONTO
Guelph
Hamilton
London
Sarnia
L. Ontario
Niagara Falls
Buffalo
L. Erie
UNITED STATES
WIS.
L. Michigan
MICH
Milwaukee
DETROIT
Windsor
Cleveland
PA.
NEW YORK
74°
73°
72°
46°
MILES
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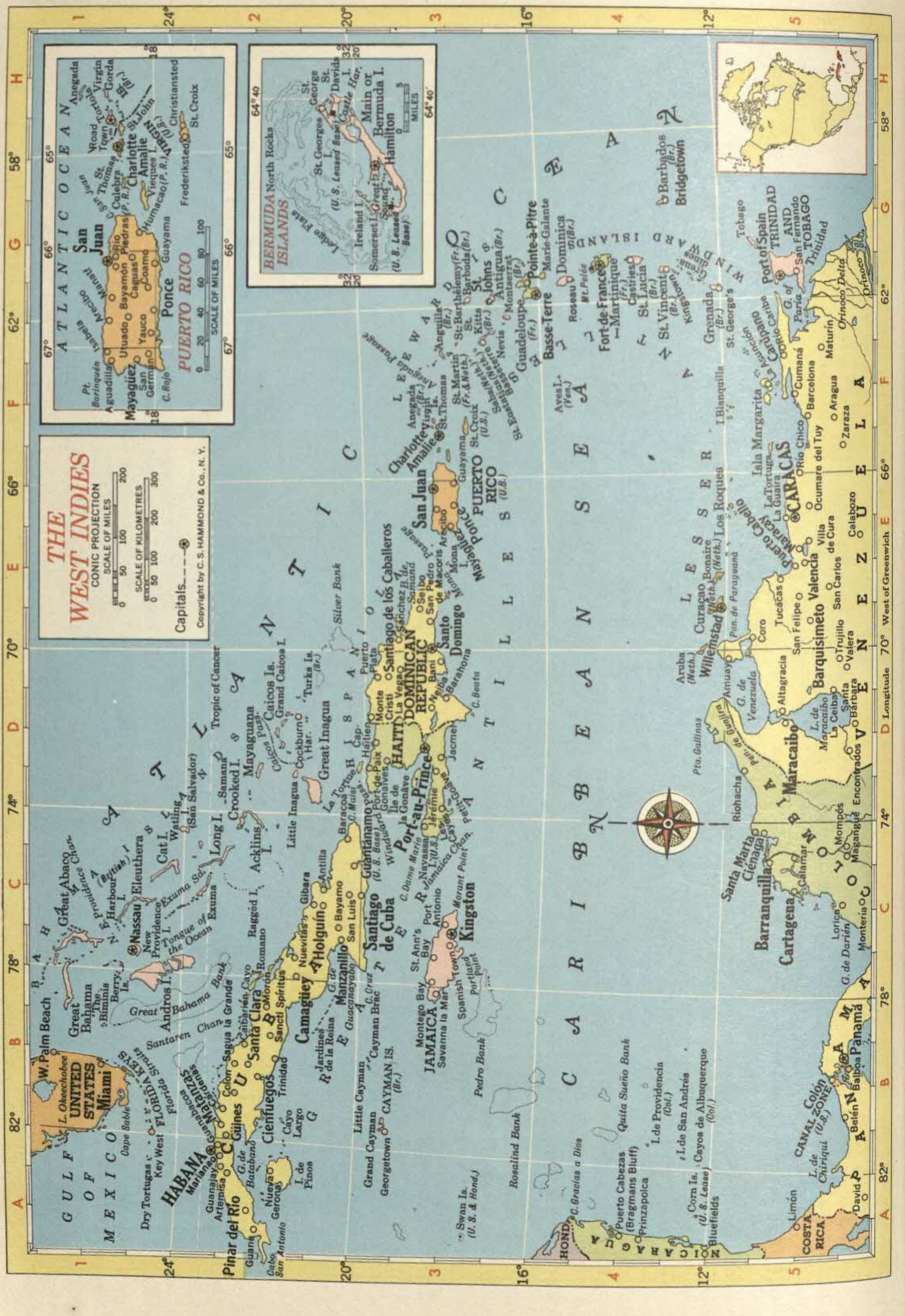
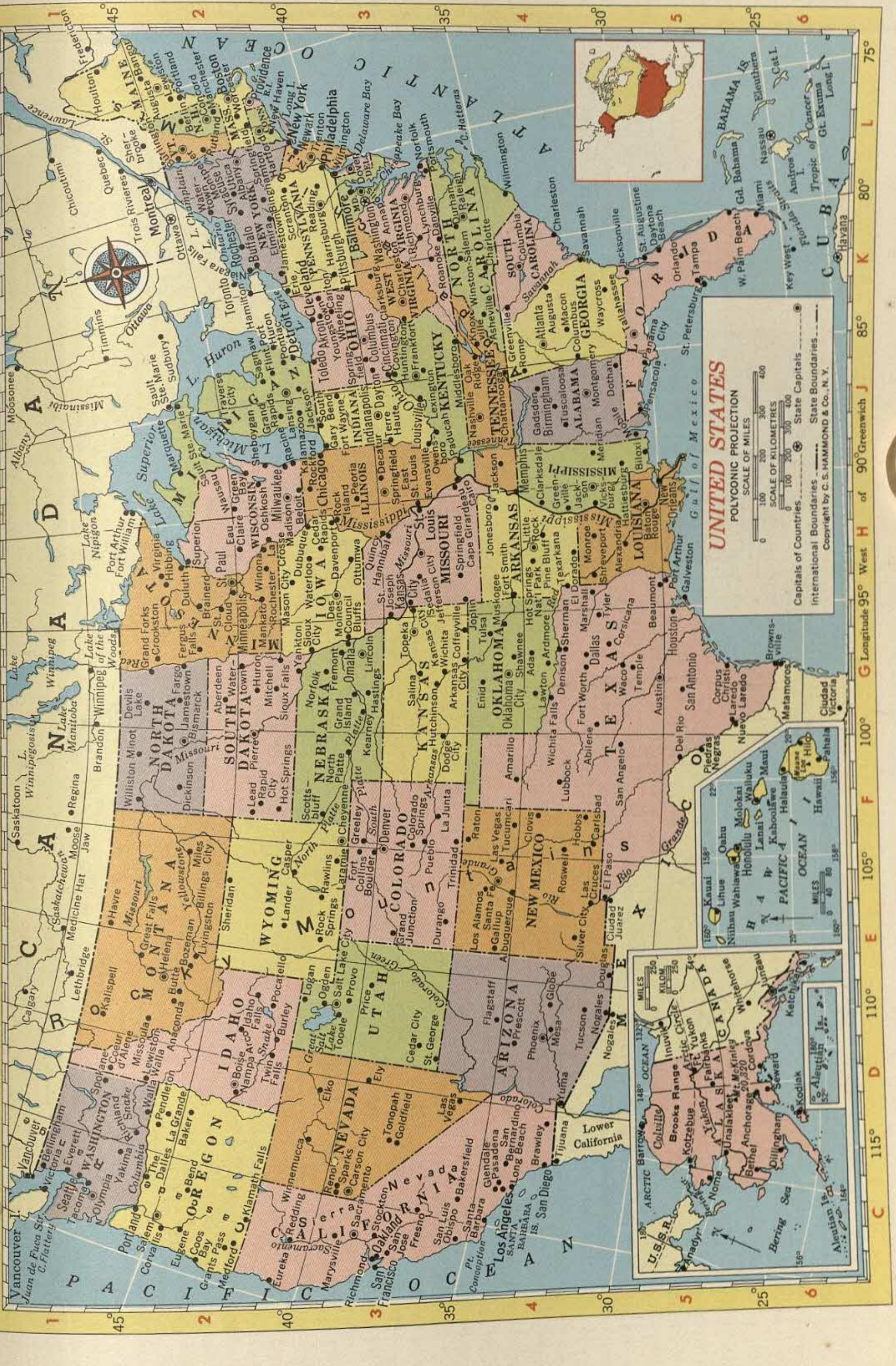
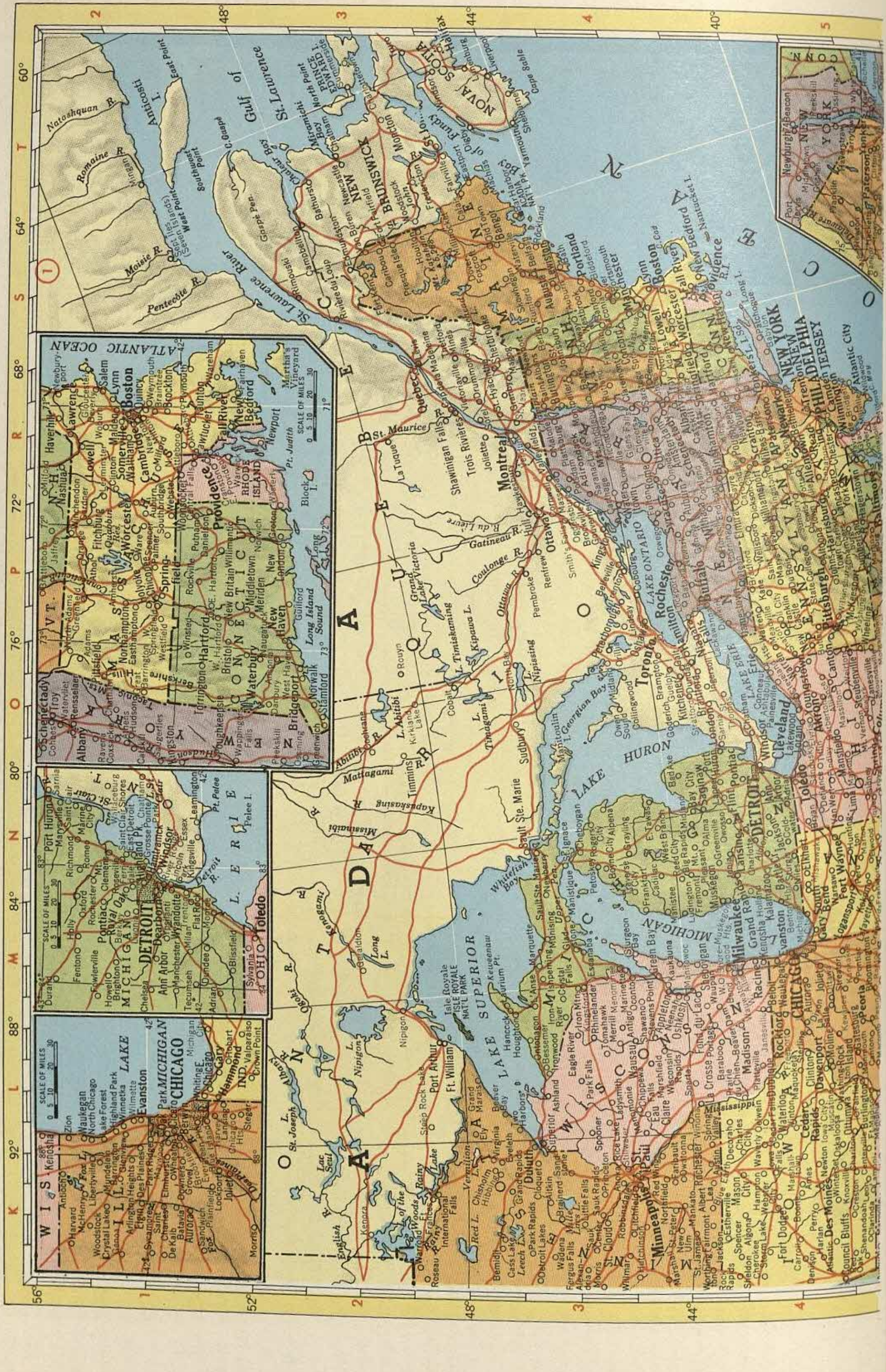
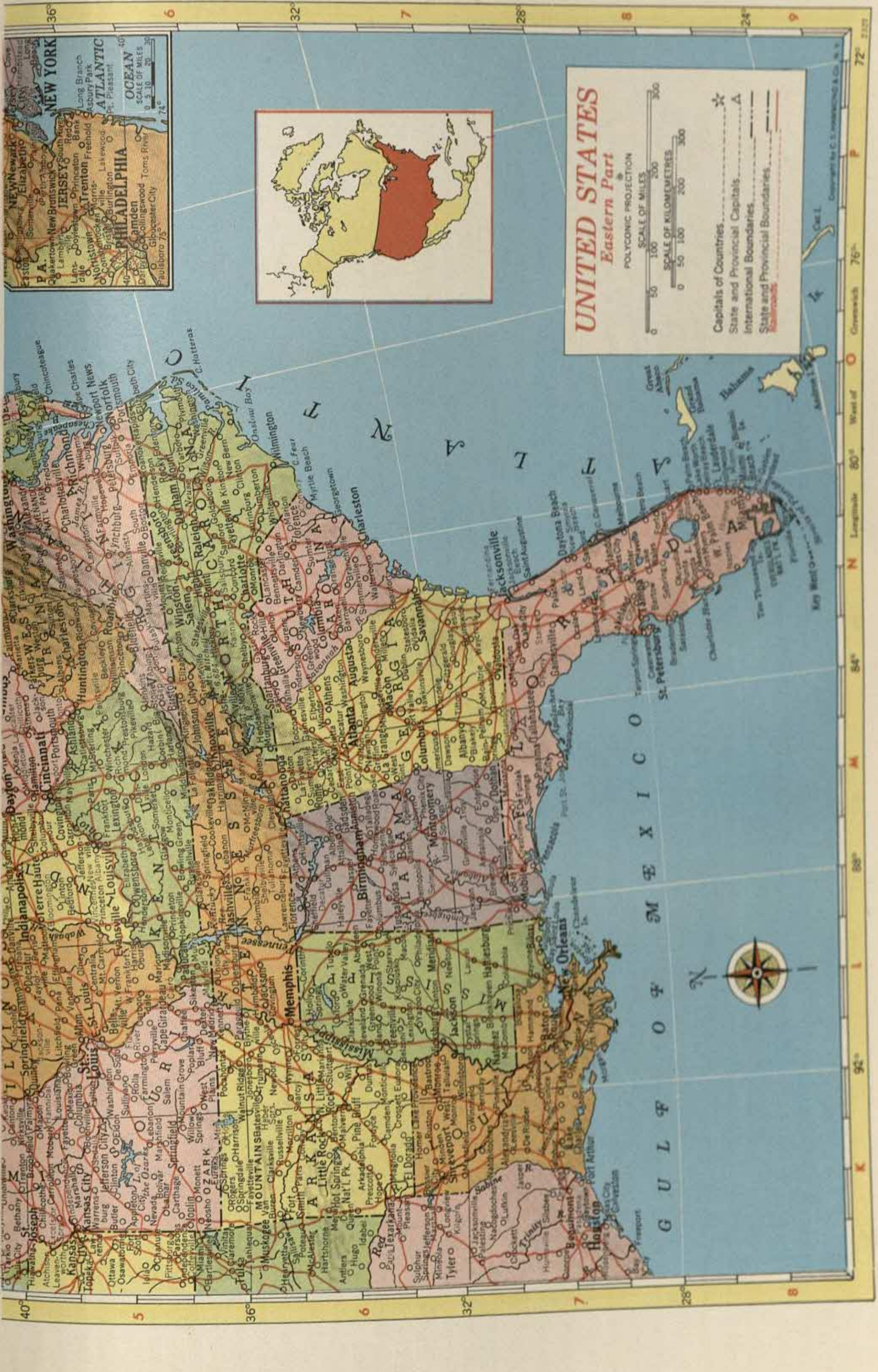
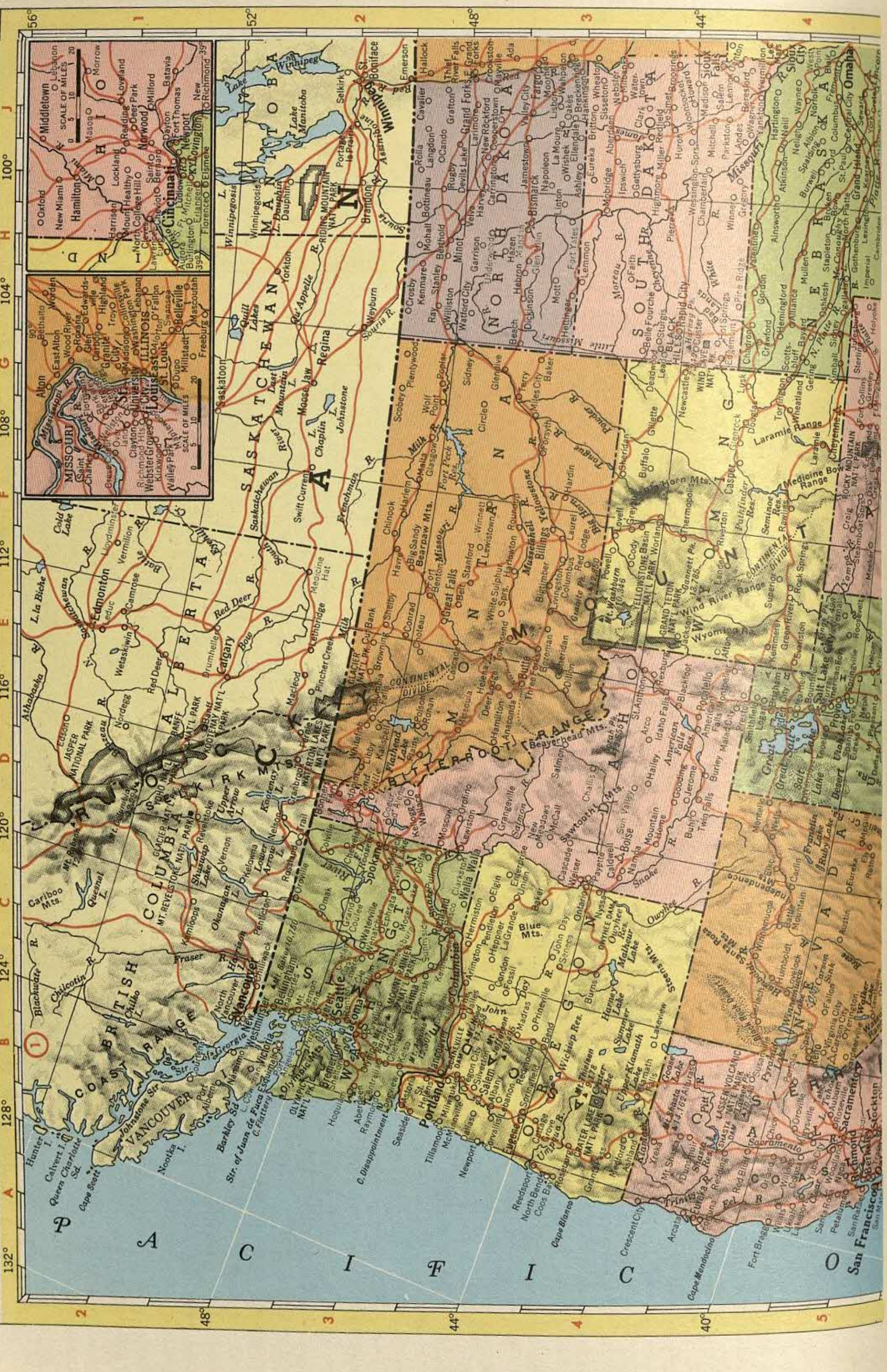
Berthierville
Victoriaville
Sorel
Drummondville
Joliette
St. Jerome
Lachute
Richmond
St. Hyacinthe
Lachine
Longueuil
St. Lambert
Verdun
Sherbrooke
Beauharnois
Granby
St. Jean
Farnham
Magog
Valleyfield
Bedford
90°
West of Greenwich
H
80°
J
70°
K
9690

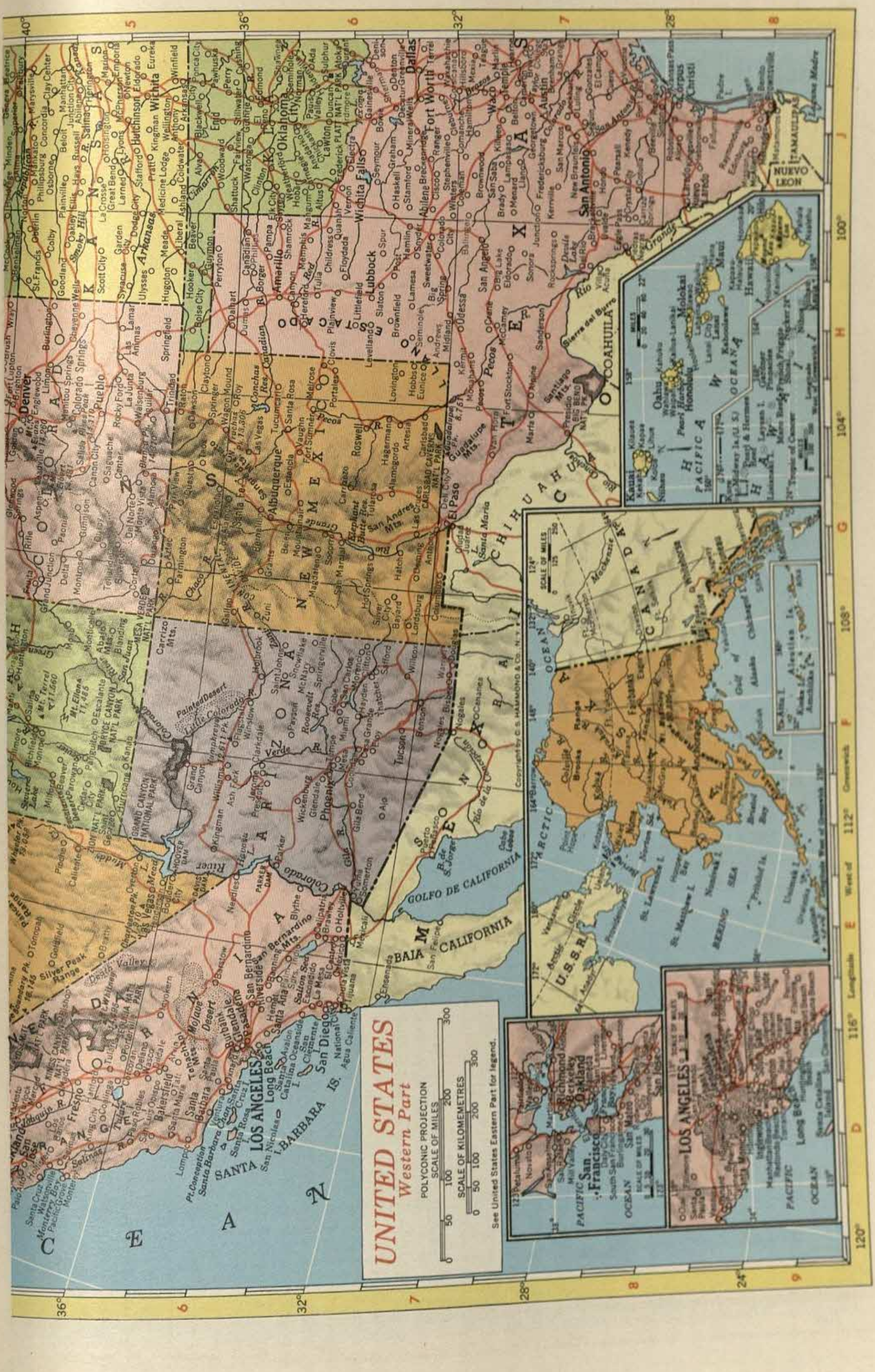

THE WEST INDIES
CONIC PROJECTION
SCALE OF MILES
0 50 100 200
SCALE OF KILOMETRES
0 50 100 200 300
Capitals
Copyright by C. S. HAMMOND & Co., N. Y.
PUERTO RICO
SCALE OF MILES
ATLANTIC OCEAN
San Juan
Ponce
Mayagüez
Arecibo
Aguadilla
Caguas
Guayama
Humacao (P.R.)
Vieques I.
Culebra
Charlotte Amalie
St. Thomas
St. John
Tortola
Road Town
Virgin Gorda
Anegada
St. Croix
Christiansted
Frederiksted
VIRGIN IS. (U.S.)
BERMUDA ISLANDS
North Rocks
St. George
St. Georges I.
(U. S. Leased Base)
St. Davids I.
Castle Har.
Main or Bermuda I.
Hamilton
Great Sound
Ireland I.
Somerset I.
Ledge Flats
MILES
GULF OF MEXICO
ATLANTIC OCEAN
CARIBBEAN SEA
Tropic of Cancer
UNITED STATES
Miami
W. Palm Beach
L. Okeechobee
Key West
Dry Tortugas
Cape Sable
FLORIDA KEYS
Florida Straits
BAHAMA (British) IS.
Great Abaco
Great Bahama
Nassau
New Providence I.
Eleuthera
Andros I.
Cat I.
Watling I. (San Salvador)
Long I.
Crooked I.
Acklins I.
Mayaguana
Great Inagua
Little Inagua
Great Bahama Bank
Tongue of the Ocean
Exuma Sd.
Santaren Chan.
Caicos Is.
Grand Caicos I.
Turks Is. (Br.)
Cockburn Har.
Silver Bank
CUBA
HABANA
Pinar del Río
Matanzas
Cárdenas
Santa Clara
Cienfuegos
Trinidad
Sancti Spíritus
Camagüey
Holguín
Bayamo
Manzanillo
Santiago de Cuba
Guantánamo (U.S. Base)
I. de Pinos
Nueva Gerona
Cabo San Antonio
GREAT ANTILLES
CAYMAN IS. (Br.)
Grand Cayman
Little Cayman
Cayman Brac
Georgetown
JAMAICA
Kingston
Spanish Town
Montego Bay
St. Ann's Bay
Port Antonio
Savanna la Mar
Morant Point
Portland Point
Pedro Bank
HISPANIOLA
HAITI
Port-au-Prince
Cap-Haïtien
Gonaïves
Port-de-Paix
La Tortue
Île de la Gonâve
Jacmel
Jérémie
Les Cayes
Windward Passage
DOMINICAN REPUBLIC
Santo Domingo
Santiago de los Caballeros
Puerto Plata
La Vega
Barahona
San Pedro de Macorís
Mona Passage
PUERTO RICO (U.S.)
LEEWARD ISLANDS
Anguilla
St. Martin
St. Barthélemy
Barbuda
Antigua
St. Johns
St. Kitts
Nevis
Montserrat
Guadeloupe
Basse-Terre
Pointe-à-Pitre
Marie-Galante
Dominica
Roseau
WINDWARD ISLANDS
Martinique
Fort-de-France
St. Lucia
Castries
St. Vincent
Kingstown
Grenadines
Grenada
St. George's
Barbados
Bridgetown
TRINIDAD AND TOBAGO
Port of Spain
San Fernando
Tobago
Trinidad
LESSER ANTILLES
Aves I. (Ven.)
Los Roques
Curaçao
Willemstad
Bonaire
Aruba (Neth.)
VENEZUELA
CARACAS
La Guaira
Maracaibo
L. de Maracaibo
G. de Venezuela
Valencia
Barquisimeto
Puerto Cabello
Maracay
Barcelona
Cumaná
Maturín
Orinoco Delta
Isla Margarita
Ciudad Bolívar
COLOMBIA
Barranquilla
Cartagena
Santa Marta
Ciénaga
Riohacha
Montería
Magangué
PANAMA
Panamá
Colón
CANAL ZONE (U.S.)
Balboa
David
G. de Chiriquí
COSTA RICA
Limón
NICARAGUA
Bluefields
Puerto Cabezas (Bragmans Bluff)
C. Gracias a Dios
I. de Providencia (Col.)
I. de San Andrés
Corn Is. (U.S. Lease)
Swan Is. (U.S. & Hond.)
Rosalind Bank
Quita Sueño Bank
HOND.
Longitude West of Greenwich


UNITED STATES
POLYCONIC PROJECTION
SCALE OF MILES
0 100 200 300 400
SCALE OF KILOMETRES
0 100 200 300 400
Capitals of Countries
State Capitals
International Boundaries
State Boundaries
Copyright by C. S. HAMMOND & Co., N.Y.
Longitude 95° West of 90° Greenwich
CANADA
MEXICO
CUBA
BAHAMA IS.
PACIFIC OCEAN
ATLANTIC OCEAN
Gulf of Mexico
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
MARYLAND
DELAWARE
NEW JERSEY
PENNSYLVANIA
NEW YORK
CONN.
R.I.
MASS.
VT.
N.H.
MAINE
ALASKA
HAWAII
ARCTIC OCEAN
Bering Sea
Aleutian Is.
Lower California
Tropic of Cancer


C A N A D A
O N T A R I O
Q U E B E C
NEW BRUNSWICK
NOVA SCOTIA
PRINCE EDWARD I.
M A I N E
N.H.
VT.
MASS.
CONN.
R.I.
N E W   Y O R K
P E N N S Y L V A N I A
NEW JERSEY
O H I O
M I C H I G A N
I N D.
I L L.
W I S C O N S I N
M I N N.
I O W A
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ERIE
LAKE ONTARIO
Georgian Bay
Gulf of St. Lawrence
St. Lawrence River
Anticosti I.
Bay of Fundy
O C E A N
Montreal
Quebec
Ottawa
Toronto
Boston
NEW YORK
PHILADELPHIA
Buffalo
Cleveland
DETROIT
CHICAGO
Milwaukee
Minneapolis
St. Paul
Duluth
Pittsburgh
Providence
Portland
ATLANTIC OCEAN
SCALE OF MILES 0 5 10 20 30
SCALE OF MILES 0 5 10 20 30
SCALE OF MILES 0 5 10 20 30
K L M N O P Q R S T
1 2 3 4 5
56° 52° 48° 44° 40°
60° 64° 68° 72° 76° 80° 84° 88° 92°


UNITED STATES
Eastern Part
POLYCONIC PROJECTION
SCALE OF MILES
0 50 100 200 300
SCALE OF KILOMETRES
0 50 100 200 300
Capitals of Countries
State and Provincial Capitals
International Boundaries
State and Provincial Boundaries
Railroads
GULF OF MEXICO
ATLANTIC
NEW YORK
PHILADELPHIA
Washington
Jacksonville
New Orleans
Memphis
Houston
Longitude West of Greenwich
Copyright by C. S. HAMMOND & Co., N. Y.


PACIFIC OCEAN
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
WASHINGTON
OREGON
IDAHO
MONTANA
WYOMING
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
NEVADA
UTAH
CALIFORNIA
Seattle
Portland
Spokane
Vancouver
Victoria
Calgary
Edmonton
Regina
Winnipeg
Salt Lake City
Cheyenne
Omaha
San Francisco
Sacramento
Boise
Helena
Bismarck
Pierre
Cincinnati
St. Louis
East St. Louis
SCALE OF MILES



UNITED STATES
Western Part

POLYCONIC PROJECTION

SCALE OF MILES
0 50 100 200 300

SCALE OF KILOMETRES
0 50 100 200 300

See United States Eastern Part for legend.

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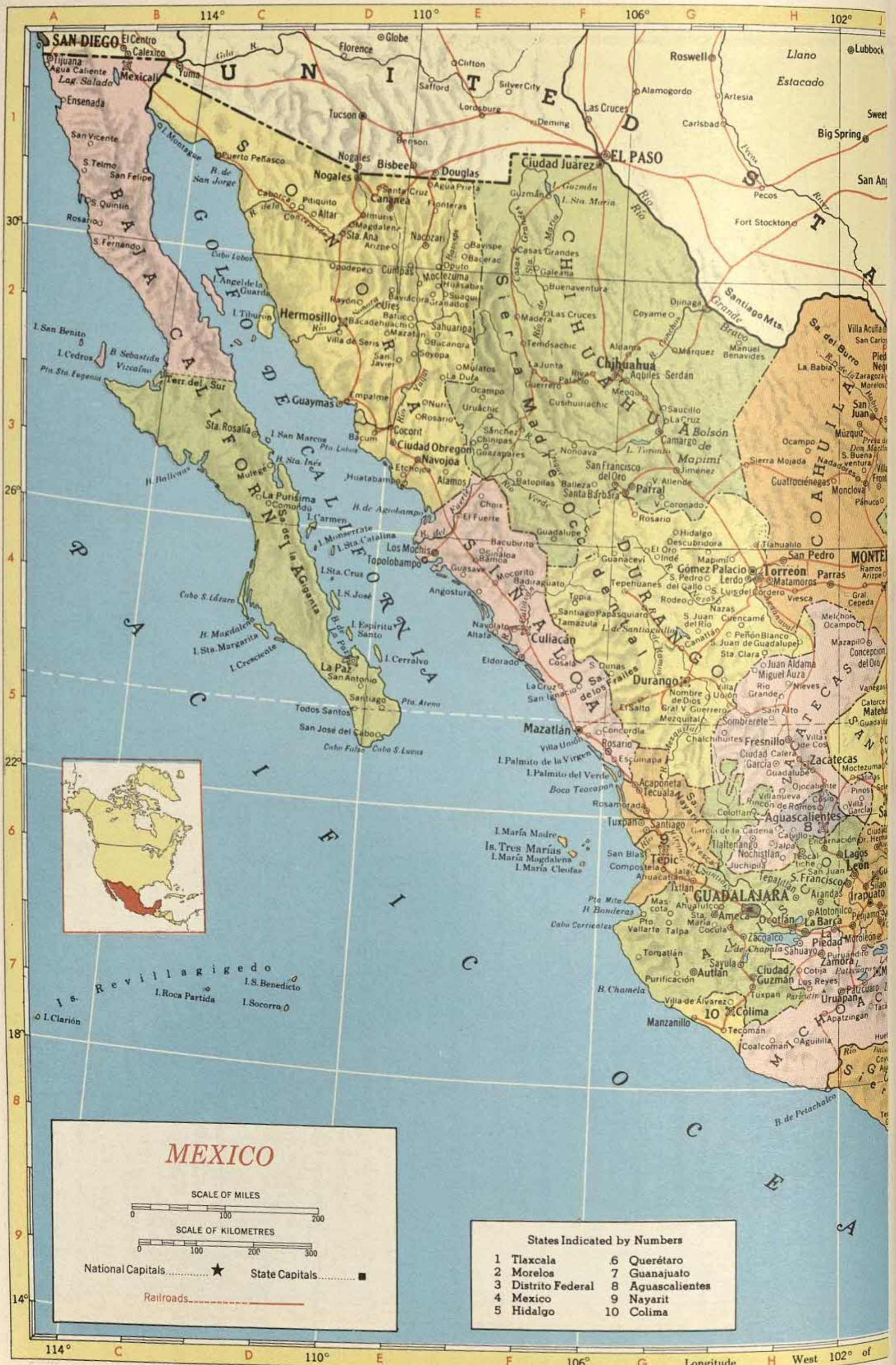
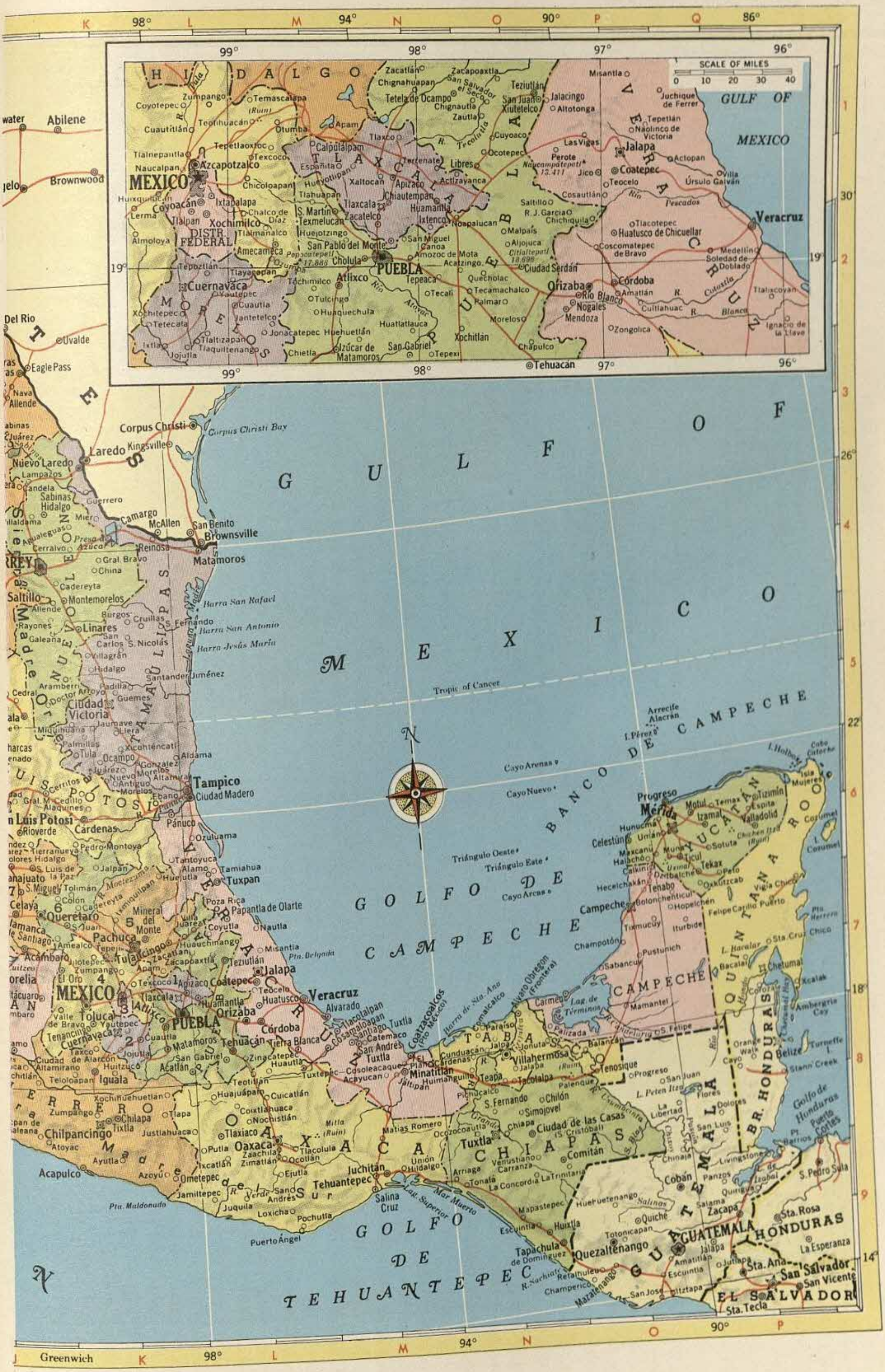
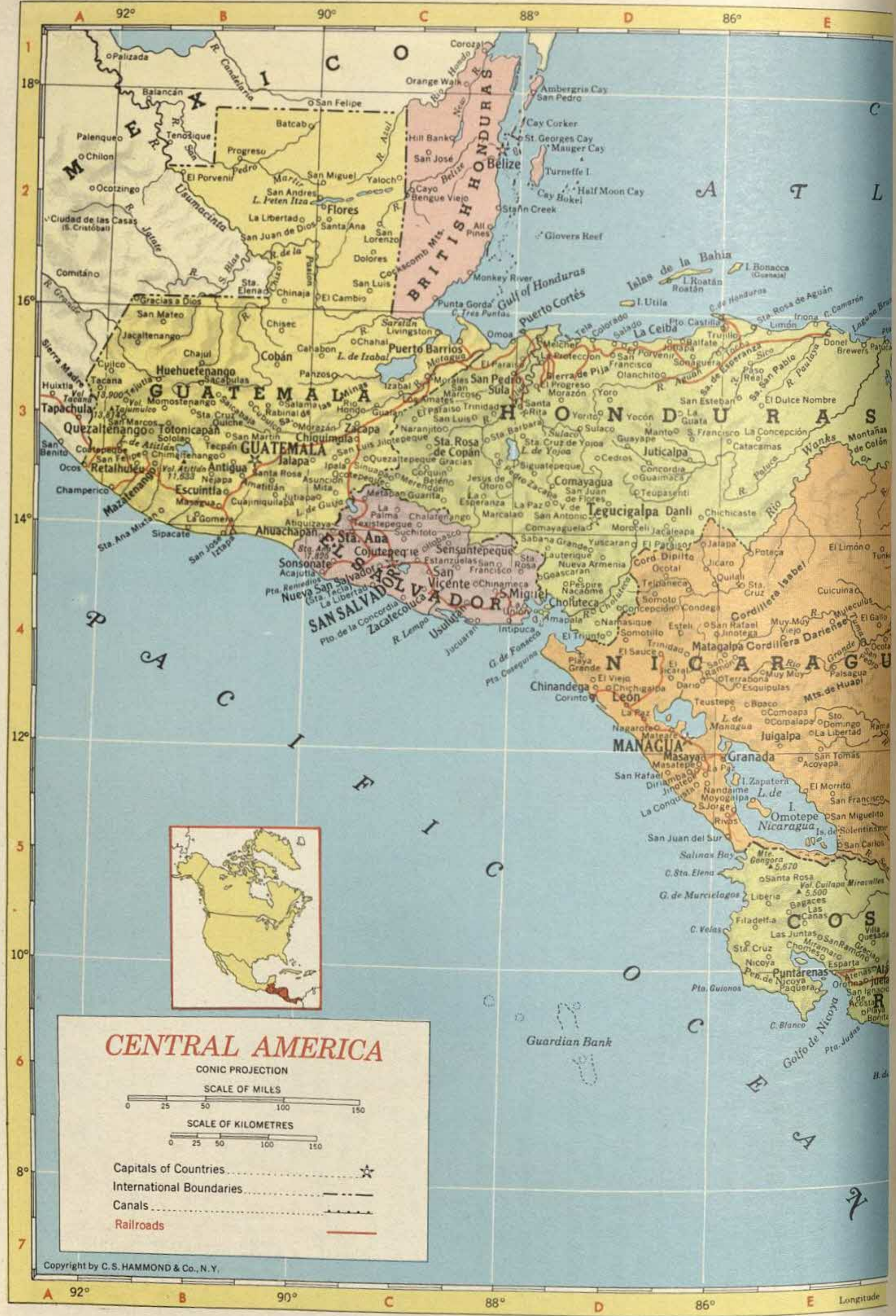

MEXICO
SCALE OF MILES
0
100
200
SCALE OF KILOMETRES
0
100
200
300
National Capitals.......... ★
State Capitals.......... ■
Railroads
States Indicated by Numbers
1 Tlaxcala
2 Morelos
3 Distrito Federal
4 Mexico
5 Hidalgo
6 Querétaro
7 Guanajuato
8 Aguascalientes
9 Nayarit
10 Colima
A
B
C
D
E
F
G
H
114°
110°
106°
102°
30°
26°
22°
18°
14°
1
2
3
4
5
6
7
8
9
Longitude
West
of
UNITED STATES
SAN DIEGO
El Centro
Calexico
Tijuana
Agua Caliente
Lag. Salada
Mexicali
Yuma
Ensenada
San Vicente
S. Telmo
San Felipe
S. Quintin
Rosario
S. Fernando
BAJA CALIFORNIA
Terr. del Sur
I. San Benito
I. Cedros
B. Sebastián Vizcaíno
Pta. Sta. Eugenia
Sta. Rosalía
Mulegé
H. Ballenas
La Purísima
Comondú
Sa. de la Giganta
Cabo S. Lázaro
B. Magdalena
I. Sta. Margarita
I. Creciente
La Paz
San Antonio
Santiago
Todos Santos
San José del Cabo
Cabo Falso
Cabo S. Lucas
Pta. Arena
GOLFO DE CALIFORNIA
I. Angel de la Guarda
I. Tiburón
I. San Marcos
Pta. Lobos
B. Sta. Inés
I. Carmen
I. Monserrate
I. Sta. Catalina
I. Sta. Cruz
I. S. José
I. Espíritu Santo
I. Cerralvo
Cabo Lobos
B. de San Jorge
Puerto Peñasco
SONORA
Gila R.
Florence
Globe
Clifton
Safford
Silver City
Lordsburg
Deming
Tucson
Benson
Nogales
Bisbee
Douglas
Agua Prieta
Caborca
Pitiquito
Altar
Santa Cruz
Cananea
Fronteras
Imuris
Magdalena
Sta. Ana
Arizpe
Nacozari
Bavispe
Bacerac
Oputo
Opodepe
Cumpas
Moctezuma
Huásabas
Suaqui
Granados
Bavicora
Rayón
Ures
Batuc
Hermosillo
Bacadehuachi
Mazatán
Sahuaripa
Villa de Seris
Bacanora
San Javier
Soyopa
Mulatos
La Dura
Guaymas
Empalme
Nuri
Rosario
Cocorit
Bácum
Ciudad Obregón
Navojoa
Etchojoa
Huatabampo
Alamos
B. de Agiabampo
Roswell
Alamogordo
Artesia
Carlsbad
Las Cruces
EL PASO
Ciudad Juárez
Llano Estacado
Lubbock
Big Spring
Pecos
Fort Stockton
San Angelo
Sweetwater
TEXAS
Río Grande
Río Bravo
Santiago Mts.
L. Guzmán
L. Sta. María
Guzmán
CHIHUAHUA
Casas Grandes
Galeana
Buenaventura
Madera
Las Cruces
Temósachic
Coyame
Ojinaga
La Junta
Aldama
Márquez
Manuel Benavides
Chihuahua
Riva Palacio
Aquiles Serdán
Guerrero
Meoqui
Cusihuiriachic
Ocampo
Uruachic
Saucillo
La Cruz
Camargo
Bolsón de Mapimí
Chínipas
Sánchez
Guazapares
Nonoava
L. Toronto
Jiménez
San Francisco del Oro
Batopilas
Balleza
Santa Bárbara
Parral
V. Allende
V. Coronado
Rosario
Sierra Madre Occidental
Sierra Mojada
COAHUILA
Villa Acuña
San Carlos
Piedras Negras
La Babia
Zaragoza
Morelos
San Juan
Múzquiz
Ocampo
S. Buenaventura
Nadadores
Cuatrociénegas
Monclova
Pánuco
Sa. del Burro
SINALOA
Choix
El Fuerte
Los Mochis
Topolobampo
Bacubirito
Sinaloa
Bamoa
Guasave
Mocorito
Badiraguato
Angostura
Navolato
Altata
Culiacán
Eldorado
Cosalá
S. Dimas
La Cruz
San Ignacio
Sa. de los Frailes
Mazatlán
Villa Unión
Concordia
Rosario
Escuinapa
I. Palmito de la Virgen
I. Palmito del Verde
Boca Teacapan
DURANGO
Guadalupe
Hidalgo
Descubridora
El Oro
Indé
Guanaceví
Mapimí
Tlahualilo
San Pedro
Gómez Palacio
Torreón
S. Pedro del Gallo
Lerdo
Matamoros
Parras
Tepehuanes
S. Luis del Cordero
Viesca
Topia
Rodeo
Nazas
Santiago Papasquiaro
Tamazula
S. Juan del Río
Cuencamé
Canatlán
Peñón Blanco
S. Juan de Guadalupe
Sta. Clara
Durango
Nombre de Dios
Villa Unión
El Salto
Gral. V. Guerrero
Mezquital
MONTERREY
Ramos Arizpe
Gral. Cepeda
Melchor Ocampo
Mazapil
Concepción del Oro
ZACATECAS
Juan Aldama
Miguel Auza
Río Grande
Nieves
Sain Alto
Sombrerete
Chalchihuites
Fresnillo
Villa de Cos
Ciudad García
Calera
Zacatecas
Guadalupe
Ojocaliente
Villanueva
Rincón de Romos
Cosío
Aguascalientes
Calvillo
Jalpa
Nochistlán
Juchipila
Tlaltenango
Colotlán
Vanegas
Catorce
Matehuala
Guadalcázar
Moctezuma
Salinas
Pinos
Villa García
NAYARIT
Acaponeta
Tecuala
Rosamorada
Tuxpan
Santiago
San Blas
Tepic
Compostela
Ahuacatlán
Ixtlán
Sa. Nayarit
I. María Madre
Is. Tres Marías
I. María Magdalena
I. María Cleofas
Pta. Mita
B. Banderas
Cabo Corrientes
Pto. Vallarta
Mascota
Talpa
JALISCO
GUADALAJARA
Ahualulco
Ameca
Sta. María
Cocula
Ocotlán
La Barca
Zacoalco
L. de Chapala
Sahuayo
Tomatlán
Sayula
Autlán
Ciudad Guzmán
Cotija
Los Reyes
Purificación
B. Chamela
Villa de Álvarez
Colima
Manzanillo
Tecomán
Coalcomán
Aguililla
Uruapan
Tuxpan
Paricutín
Apatzingán
Pátzcuaro
Zamora
Purépero
Piedad
Lagos
León
Encarnación
S. Juan
S. Francisco
Arandas
Atotonilco
Irapuato
Silao
Pénjamo
Moroleón
MICHOACÁN
Río Balsas
B. de Petachalco
Is. Revillagigedo
I. S. Benedicto
I. Roca Partida
I. Socorro
I. Clarión
PACIFIC OCEAN


SCALE OF MILES
0 10 20 30 40
GULF OF MEXICO
HIDALGO
TLAXCALA
PUEBLA
MORELOS
VERACRUZ
MEXICO
DISTR. FEDERAL
Azcapotzalco
Xochimilco
Cuernavaca
Tlaxcala
Puebla
Cholula
Atlixco
Tehuacán
Orizaba
Córdoba
Jalapa
Coatepec
Veracruz
Pan de Orizaba 18,698
Popocatepetl 17,888
Iztaccíhuatl 17,343
Corpus Christi
Laredo
Nuevo Laredo
McAllen
Brownsville
Matamoros
Reinosa
Saltillo
Monterrey
Linares
Ciudad Victoria
Tampico
Ciudad Madero
San Luis Potosí
Querétaro
Pachuca
Tuxpan
Poza Rica
Toluca
Cuernavaca
Puebla
Veracruz
Alvarado
Coatzacoalcos
Minatitlán
Villahermosa
Campeche
Mérida
Progreso
Valladolid
Cozumel
Chetumal
Oaxaca
Juchitán
Tehuantepec
Salina Cruz
Tuxtla
Ciudad de las Casas
Comitán
Tapachula
Acapulco
Chilpancingo
Iguala
Puerto Ángel
Quezaltenango
Guatemala
Belize
Sta. Ana
San Salvador
San Vicente
Sta. Tecla
GULF OF MEXICO
GOLFO DE CAMPECHE
BANCO DE CAMPECHE
GOLFO DE TEHUANTEPEC
Tropic of Cancer
TAMAULIPAS
NUEVO LEÓN
SAN LUIS POTOSÍ
OAXACA
CHIAPAS
TABASCO
CAMPECHE
YUCATÁN
QUINTANA ROO
GUERRERO
GUATEMALA
BR. HONDURAS
HONDURAS
EL SALVADOR
TEXAS
Golfo de Honduras
Cayo Arenas
Cayo Nuevo
Triángulo Oeste
Triángulo Este
Cayo Arcas
Arrecife Alacrán
98° 94° 90° 86°
26° 22° 18° 14°
K L M N O P Q
Greenwich



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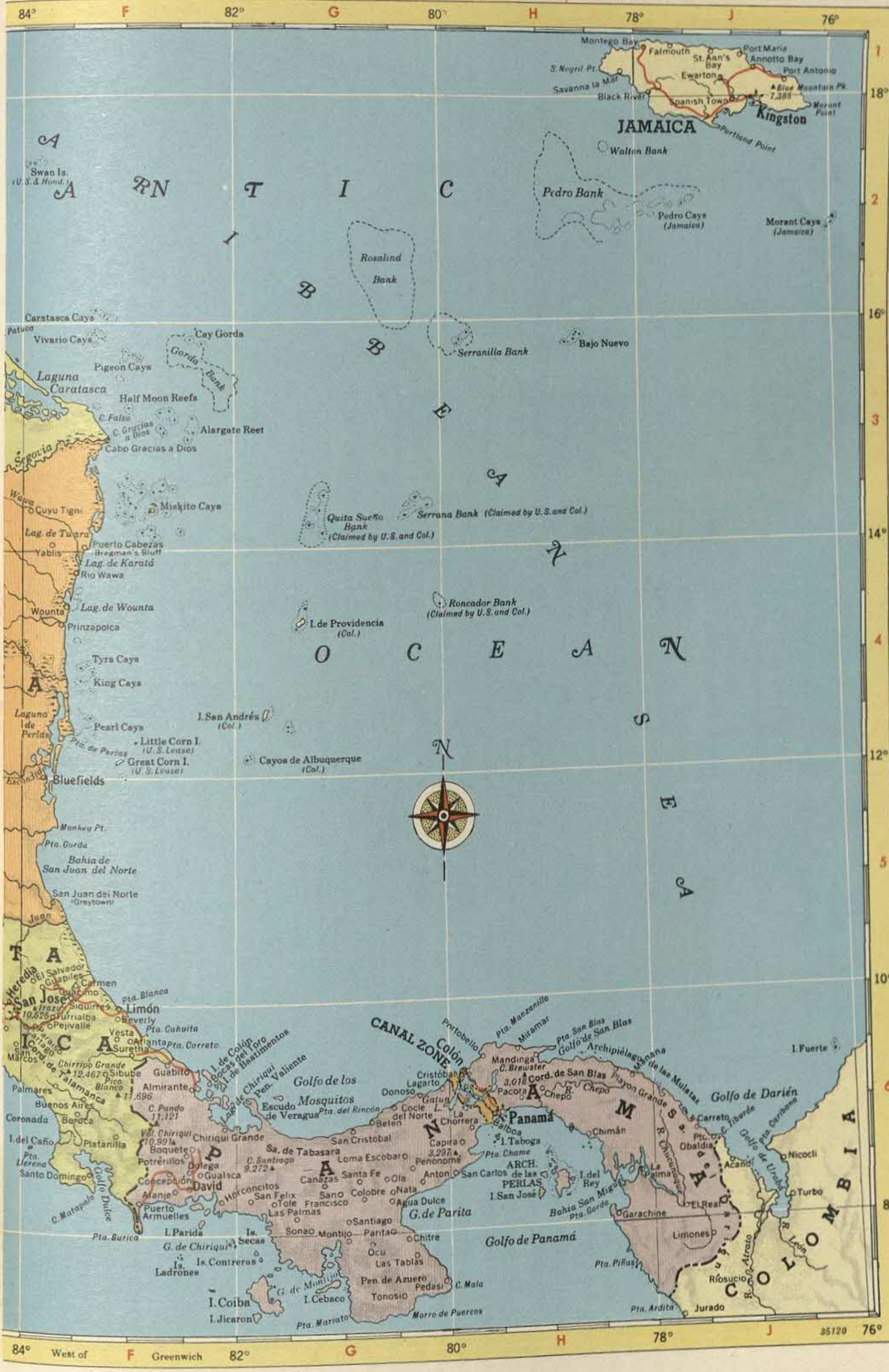
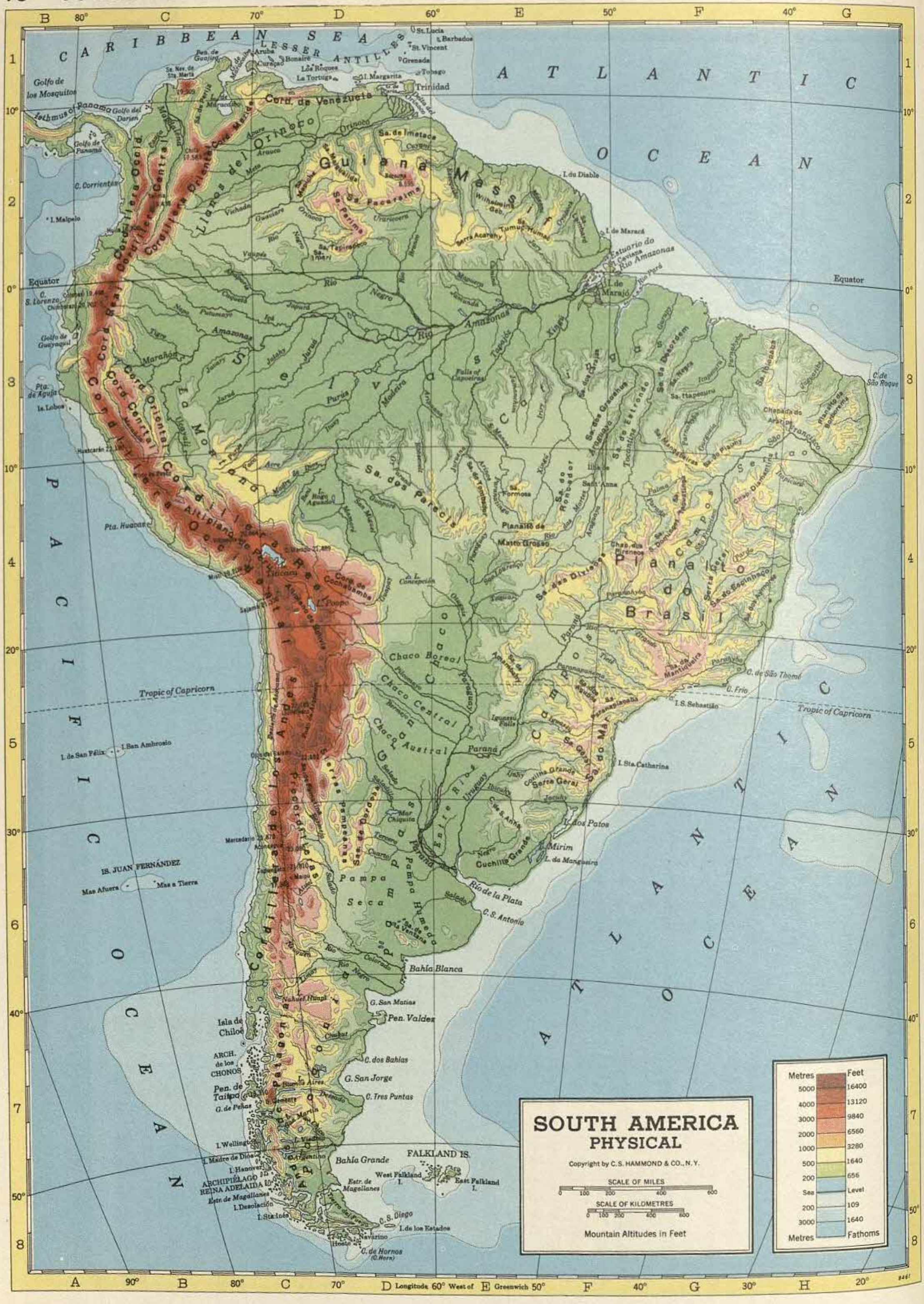

84°
F
82°
G
80°
H
78°
J
76°
18°
16°
14°
12°
10°
8°
1
2
3
4
5
6
7
CARIBBEAN SEA
OCEAN
JAMAICA
Montego Bay
Falmouth
St. Ann's Bay
Port Maria
Annotto Bay
Port Antonio
S. Negril Pt.
Savanna la Mar
Ewarton
Black River
Spanish Town
Blue Mountain Pk. 7,388
Kingston
Morant Point
Portland Point
Walton Bank
Pedro Bank
Pedro Cays (Jamaica)
Morant Cays (Jamaica)
Swan Is. (U.S. & Hond.)
Rosalind Bank
Serranilla Bank
Bajo Nuevo
Caratasca Cays
Patuca
Vivario Cays
Cay Gorda
Gorda Bank
Pigeon Cays
Laguna Caratasca
Half Moon Reefs
C. Falso
C. Gracias a Dios
Alargate Reef
Cabo Gracias a Dios
Segovia
Wawa
Cuyu Tigni
Miskito Cays
Quita Sueño Bank (Claimed by U.S. and Col.)
Serrana Bank (Claimed by U.S. and Col.)
Lag. de Tuara
Yablis
Puerto Cabezas
Bragman's Bluff
Lag. de Karatá
Rio Wawa
Roncador Bank (Claimed by U.S. and Col.)
Wounta
Lag. de Wounta
Prinzapolca
I. de Providencia (Col.)
Tyra Cays
King Cays
Laguna de Perlas
I. San Andrés (Col.)
Pearl Cays
Pta. de Perlas
Little Corn I. (U.S. Lease)
Great Corn I. (U.S. Lease)
Cayos de Albuquerque (Col.)
Escondido
Bluefields
Monkey Pt.
Pta. Gorda
Bahia de San Juan del Norte
San Juan del Norte (Greytown)
Juan
COSTA RICA
Heredia
El Salvador
Guápiles
Carmen
Pta. Blanca
San José
Irazú 10,626
Siquirres
Limón
Turrialba
Beverly
Pejivalle
Pta. Cahuita
Vesta
Atlanta
Pta. Carreta
Suretka
Marcos
Chirripó Grande 12,467
Sibube
Guabito
Talamanca
Pico Blanco 11,696
Almirante
Palmares
Buenos Aires
Boruca
Coronada
C. Pando 11,121
I. del Caño
Pta. Llorena
Platanilla
Santo Domingo
Golfo Dulce
C. Matapalo
Puerto Armuelles
Pta. Burica
I. de Colón
Bocas del Toro
I. de Bastimentos
Lag. de Chiriquí
Pen. Valiente
Golfo de los Mosquitos
Escudo de Veraguas
Pta. del Rincón
Vol. Chiriquí 10,991
Chiriquí Grande
Boquete
Potrerillos
Dolega
C. Santiago 9,272
Gualaca
Concepción
David
Alanje
Horconcitos
San Félix
Tolé
Las Palmas
Sa. de Tabasara
San Cristóbal
Loma Escobar
Cañazas
Santa Fe
Olá
San Francisco
Colobre
Natá
Agua Dulce
G. de Parita
Santiago
Sonao
Montijo
Parita
Chitré
I. Parida
Is. Secas
G. de Chiriquí
Is. Ladrones
Is. Contreras
I. Coiba
I. Jicarón
G. de Montijo
I. Cebaco
Ocú
Las Tablas
Pen. de Azuero
Pedasí
C. Mala
Tonosío
Pta. Mariato
Morro de Puercos
PANAMA
CANAL ZONE
Portobello
Colón
Pta. Manzanillo
Miramar
Cristóbal
Lagarto
Donoso
Gatún L.
Coclé del Norte
Belén
La Chorrera
Capira
3,297
Penonomé
Antón
San Carlos
Balboa
Panamá
I. Taboga
Pta. Chame
Mandinga
C. Brewster
3,018
Cord. de San Blas
Pacora
Chepo
R. Chepo
Pta. San Blas
Golfo de San Blas
Archipiélago de las Mulatas
Mandinga
Playón Grande
Chimán
ARCH. de las PERLAS
I. San José
I. del Rey
Bahía San Miguel
Pta. Gorda
La Palma
R. Chucunaque
Garachiné
Golfo de Panamá
Pta. Piñas
Pta. Ardita
Jurado
Limones
DARIEN
Carreto
Pta. Obaldía
C. Tiburón
Acandí
Golfo de Darién
Golfo de Urabá
Pta. Caribana
I. Fuerte
Nicocli
Turbo
El Real
Atrato
R. León
Riosucio
COLOMBIA
West of Greenwich
35120



SOUTH AMERICA
PHYSICAL

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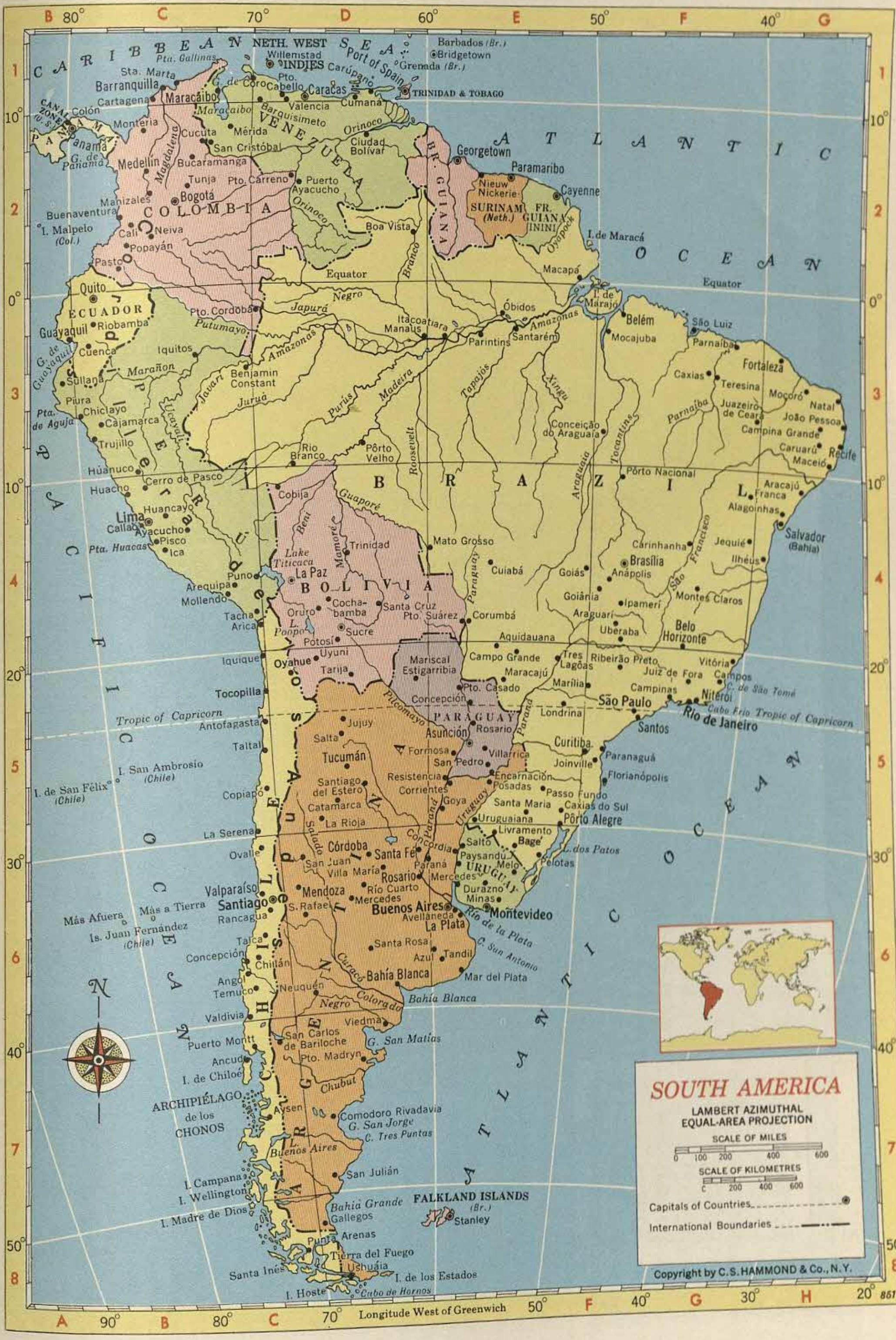
Mountain Altitudes in Feet



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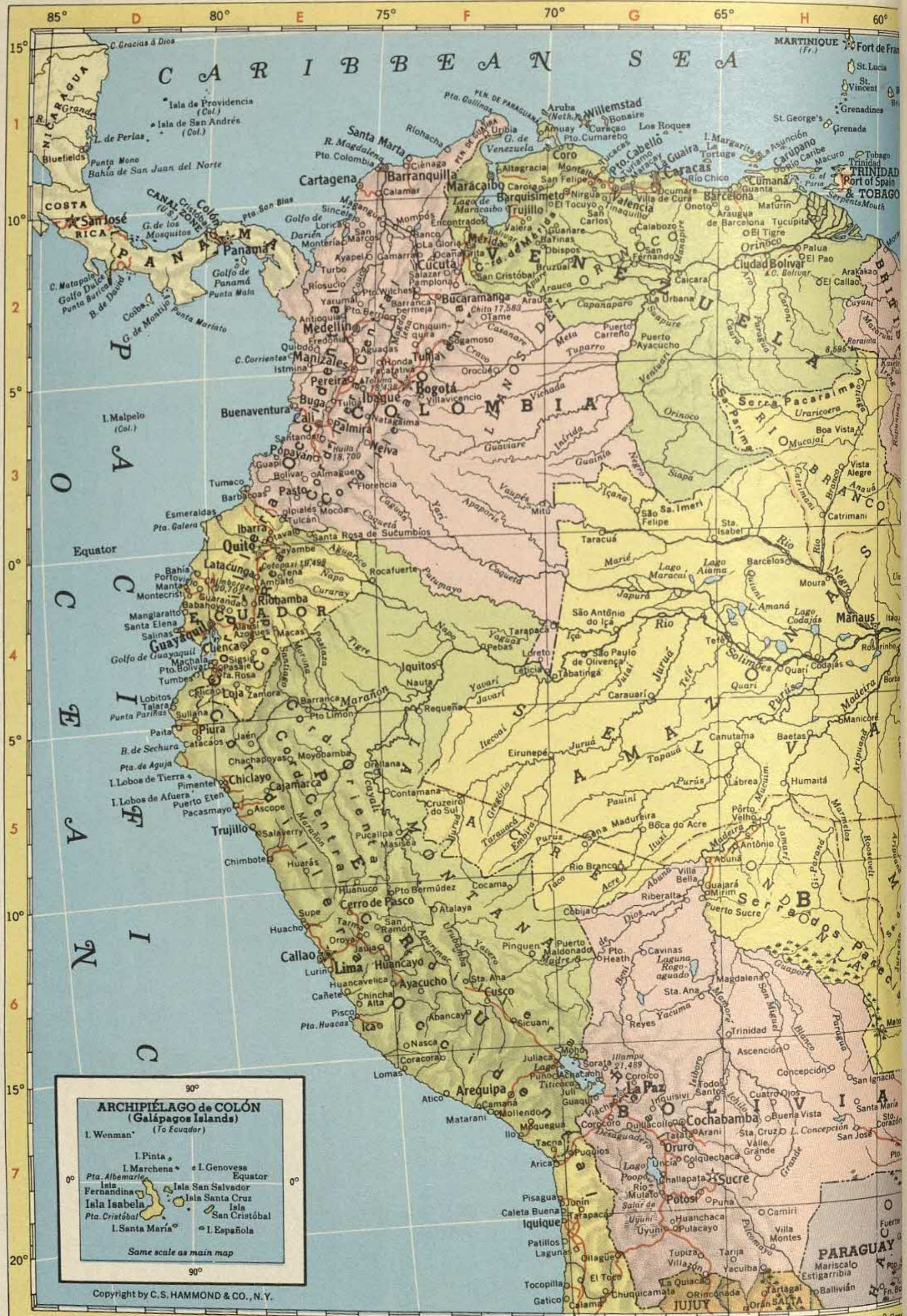
20 — SOUTH AMERICA—Northern Part



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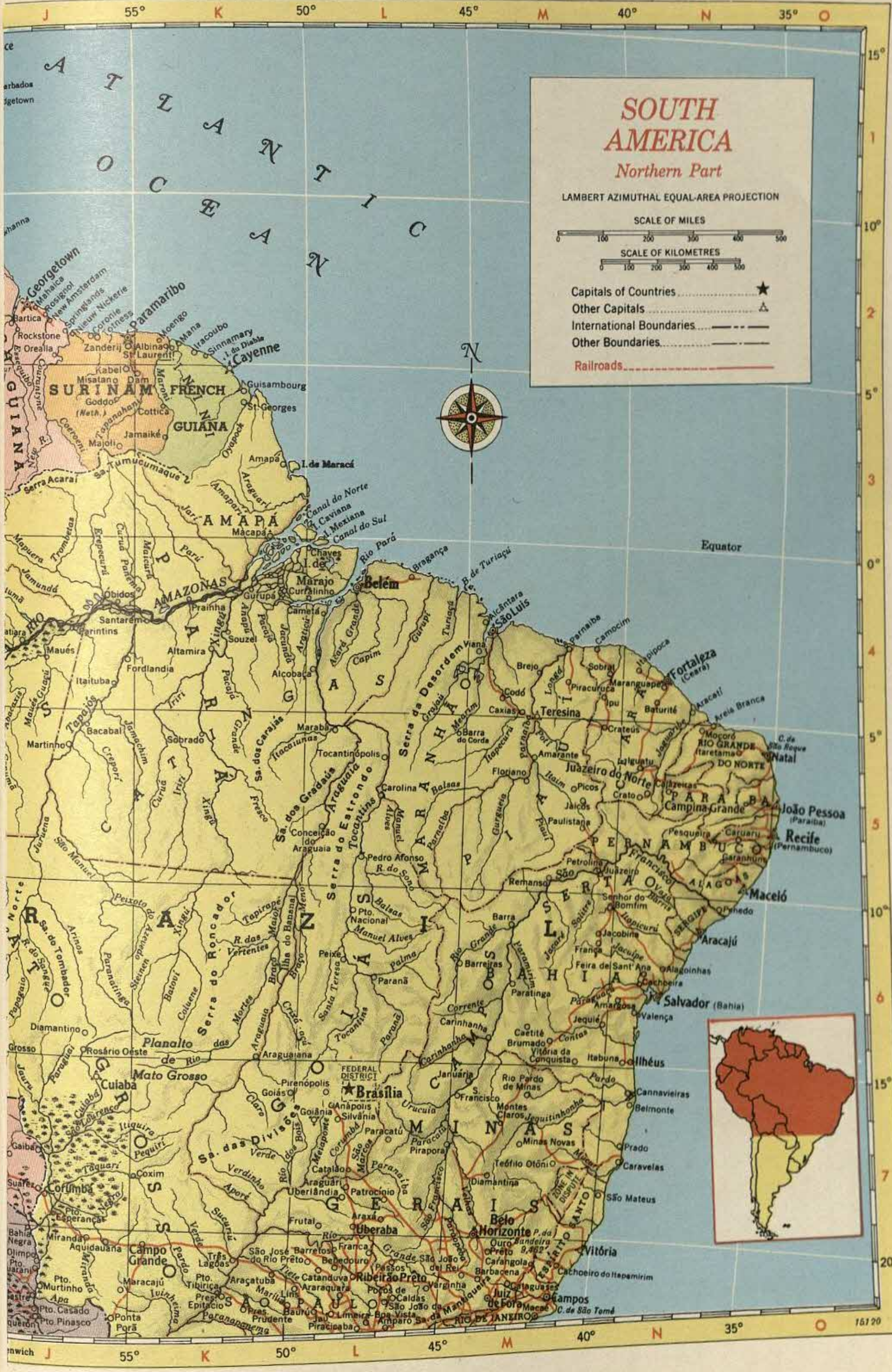
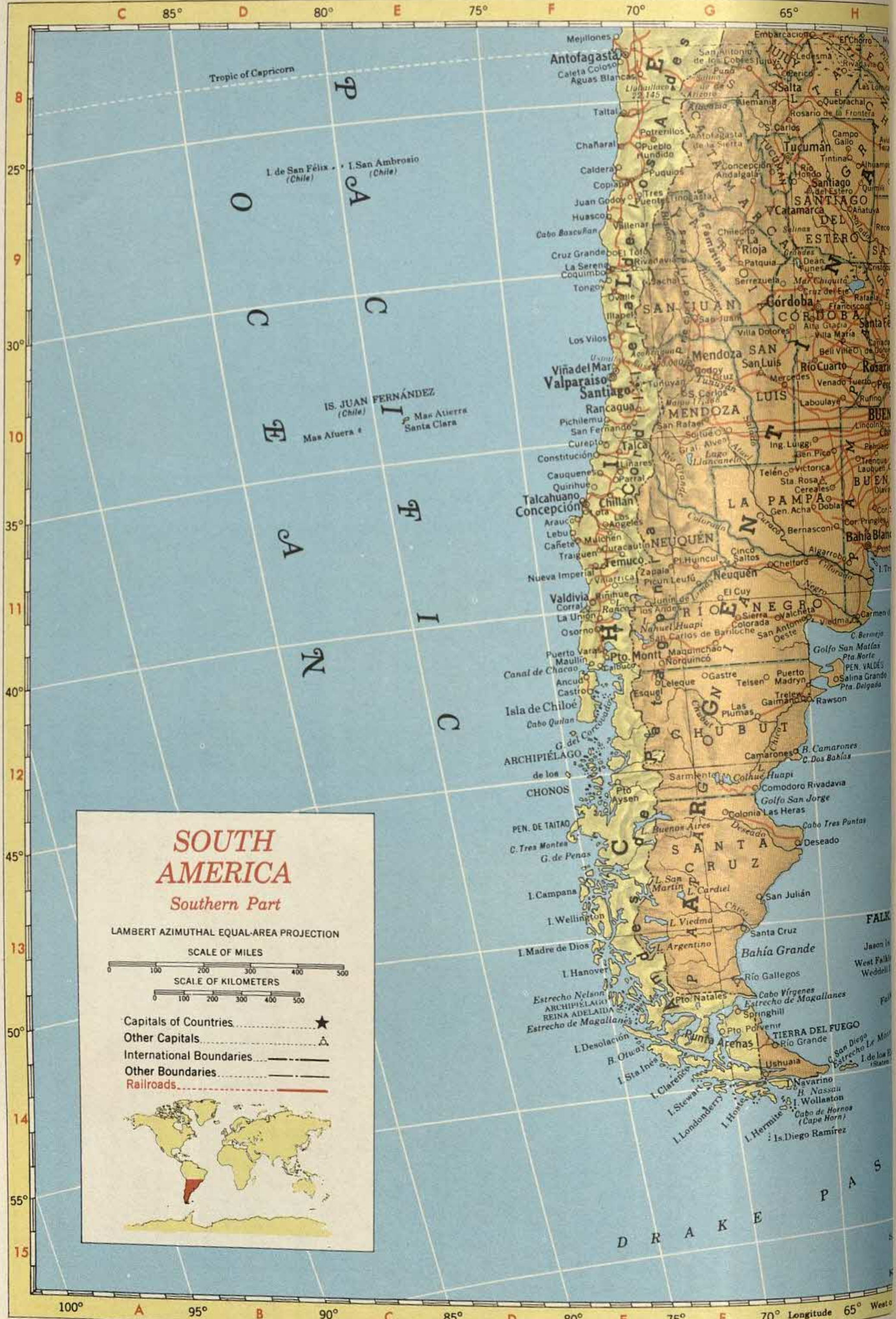
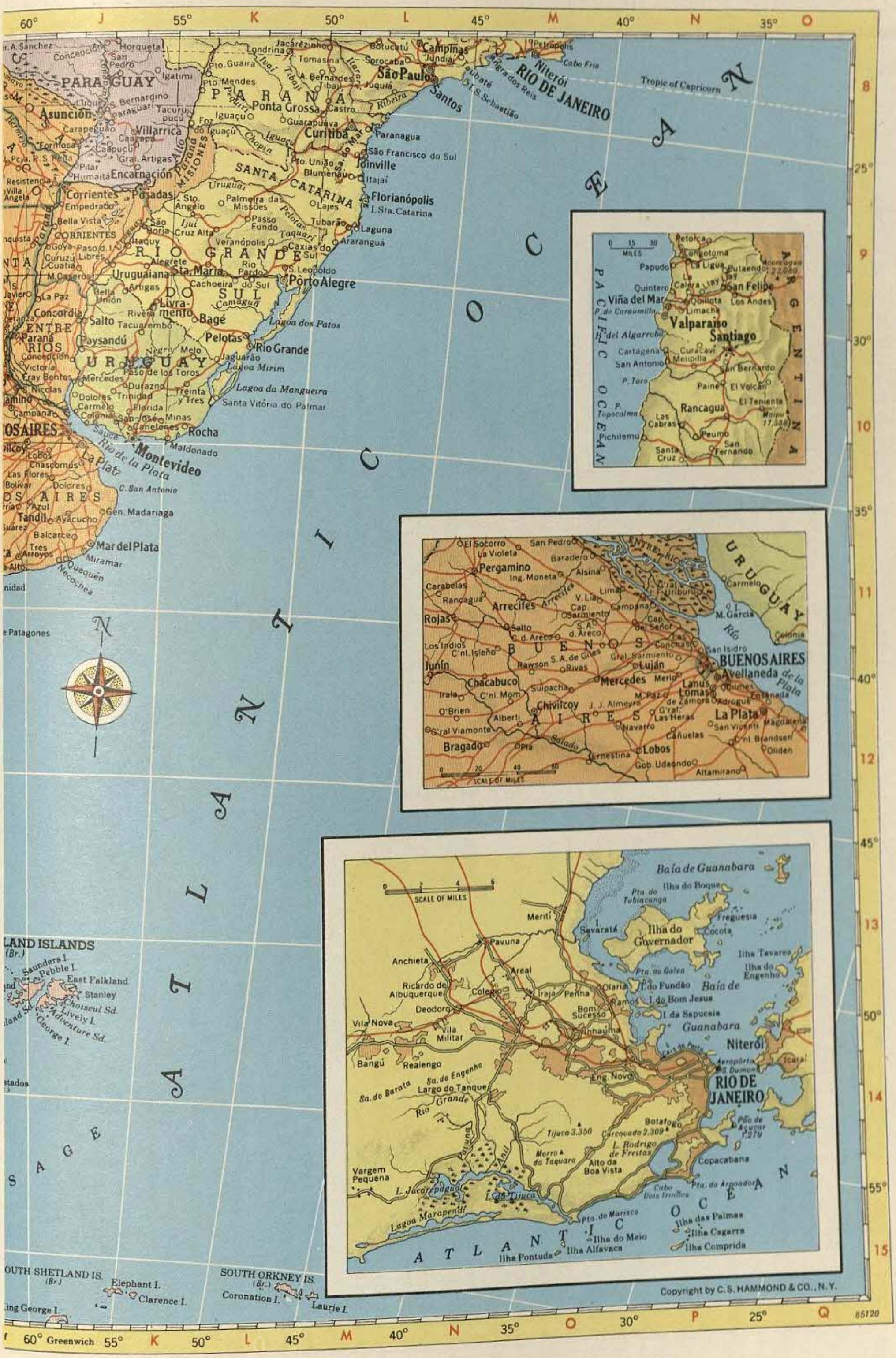

SOUTH
AMERICA
Northern Part
LAMBERT AZIMUTHAL EQUAL-AREA PROJECTION
SCALE OF MILES
0 100 200 300 400 500
SCALE OF KILOMETRES
0 100 200 300 400 500
Capitals of Countries ★
Other Capitals △
International Boundaries
Other Boundaries
Railroads
ATLANTIC OCEAN
N
Equator
J K L M N O
55° 50° 45° 40° 35°
15° 10° 5° 0° 5° 10° 15° 20°
1 2 3 4 5 6 7
Georgetown
Paramaribo
Cayenne
SURINAM (Neth.)
FRENCH GUIANA
AMAPÁ
Macapá
Belém
São Luís
Fortaleza (Ceará)
Teresina
Natal
João Pessoa (Paraíba)
Recife (Pernambuco)
Maceió
Aracajú
Salvador (Bahia)
Ilhéus
Vitória
Campos
RIO DE JANEIRO
Belo Horizonte
Brasília
FEDERAL DISTRICT
Goiás
Goiânia
Anápolis
Cuiabá
Campo Grande
Corumbá
Uberaba
Uberlândia
Ribeirão Preto
Juiz de Fora
Santarém
Óbidos
AMAZONAS
I. de Marajó
I. de Maracá
Canal do Norte
Canal do Sul
Rio Pará
MARANHÃO
PIAUÍ
CEARÁ
RIO GRANDE DO NORTE
PARAÍBA
PERNAMBUCO
ALAGOAS
SERGIPE
BAHIA
GOIÁS
MINAS GERAIS
MATO GROSSO
PARÁ
SÃO PAULO
ESPÍRITO SANTO
Planalto de Mato Grosso
Serra do Roncador
Sa. dos Carajás
Sa. dos Gradaús
Serra do Estrondo
Serra da Desordem
Tocantins
Araguaia
Xingu
Tapajós
São Francisco
Paranaíba
Rio Grande
Equator
15120


SOUTH AMERICA
Southern Part
LAMBERT AZIMUTHAL EQUAL-AREA PROJECTION
SCALE OF MILES
0 100 200 300 400 500
SCALE OF KILOMETERS
0 100 200 300 400 500
Capitals of Countries ★
Other Capitals
International Boundaries
Other Boundaries
Railroads
PACIFIC OCEAN
Tropic of Capricorn
I. de San Félix (Chile)
I. San Ambrosio (Chile)
IS. JUAN FERNÁNDEZ (Chile)
Mas Afuera
Mas Atierra
Santa Clara
DRAKE PASS
Mejillones
Antofagasta
Caleta Coloso
Aguas Blancas
Taltal
Chañaral
Caldera
Copiapó
Juan Godoy
Huasco
Cabo Bascuñan
Vallenar
Cruz Grande
La Serena
Coquimbo
Tongoy
Ovalle
Illapel
Los Vilos
Viña del Mar
Valparaíso
Santiago
Rancagua
Pichilemu
San Fernando
Curepto
Talca
Constitución
Linares
Cauquenes
Parral
Quirihue
Talcahuano
Concepción
Chillán
Lota
Los Angeles
Arauco
Lebu
Cañete
Mulchén
Curacautín
Traiguén
Temuco
Nueva Imperial
Villarrica
Valdivia
Corral
La Unión
Osorno
Puerto Varas
Maullín
Pto. Montt
Calbuco
Canal de Chacao
Ancud
Castro
Isla de Chiloé
Cabo Quilán
G. del Corcovado
ARCHIPIÉLAGO de los CHONOS
Pto. Aysen
PEN. DE TAITAO
C. Tres Montes
G. de Penas
I. Campana
I. Wellington
I. Madre de Dios
I. Hanover
Estrecho Nelson
ARCHIPIÉLAGO REINA ADELAIDA
Estrecho de Magallanes
I. Desolación
B. Otway
I. Sta. Inés
I. Clarence
I. Stewart
I. Londonderry
I. Hoste
I. Hermite
Navarino
B. Nassau
I. Wollaston
Cabo de Hornos (Cape Horn)
Is. Diego Ramírez
Ushuaia
TIERRA DEL FUEGO
Río Grande
Pto. Porvenir
Punta Arenas
Springhill
Pto. Natales
Cabo Vírgenes
Estrecho de Magallanes
Río Gallegos
Bahía Grande
Santa Cruz
L. Argentino
L. Viedma
San Julián
L. San Martín
L. Cardiel
Chico
SANTA CRUZ
Deseado
Cabo Tres Puntas
L. Buenos Aires
Colonia Las Heras
Golfo San Jorge
Comodoro Rivadavia
Sarmiento
L. Colhué Huapi
Camarones
B. Camarones
C. Dos Bahías
CHUBUT
Las Plumas
Gaiman
Trelew
Rawson
Puerto Madryn
Telsen
Gastre
Leleque
Esquel
Norquincó
Maquinchao
PEN. VALDÉS
Pta. Norte
Salina Grande
Pta. Delgada
Golfo San Matías
C. Bermejo
Viedma
Carmen de Patagones
San Antonio Oeste
Valcheta
Sierra Colorada
RIO NEGRO
San Carlos de Bariloche
L. Nahuel Huapi
El Cuy
Neuquén
Zapala
Picún Leufú
Pl. Huincul
Cinco Saltos
Chelforó
NEUQUÉN
LA PAMPA
Gen. Acha
Bernasconi
Bahía Blanca
Telén
Victorica
Sta. Rosa
Cerealés
Doblas
Ing. Luiggi
Gen. Pico
Trenque Lauquen
MENDOZA
San Rafael
Mendoza
Tupungato
Tunuyán
Godoy Cruz
S. Carlos
Maipo
SAN LUIS
San Luis
Mercedes
Villa Dolores
Río Cuarto
Laboulaye
Venado Tuerto
Rufino
Villa María
Córdoba
CÓRDOBA
Alta Gracia
Mar Chiquita
Cruz del Eje
San Francisco
Rafaela
Santa Fe
Bell Ville
Serrezuela
Patquia
La Rioja
Chilecito
SAN JUAN
San Juan
Jáchal
Catamarca
Andalgalá
Concepción
Tucumán
Santiago del Estero
SANTIAGO DEL ESTERO
Tintina
Añatuya
Salta
Jujuy
Ledesma
Embarcación
Quebrachal
Rosario de la Frontera
Campo Gallo
Llullaillaco 22,145
San Antonio de los Cobres
Puna de Atacama
Potrerillos
Pueblo Hundido
Puquios
Tres Puentes
Tinogasta
Chañaral
ANDES
ATACAMA
CHILE
ARGENTINA
PATAGONIA
BUENOS AIRES
FALKLAND
Jason Is.
West Falkland
Weddell I.
San Diego
Estrecho Le Maire
I. de los Estados (Staten)
100° 95° 90° 85° 80° 75° 70° Longitude 65° West
85° 80° 75° 70° 65°
25° 30° 35° 40° 45° 50° 55°
A B C D E F G H
8 9 10 11 12 13 14 15



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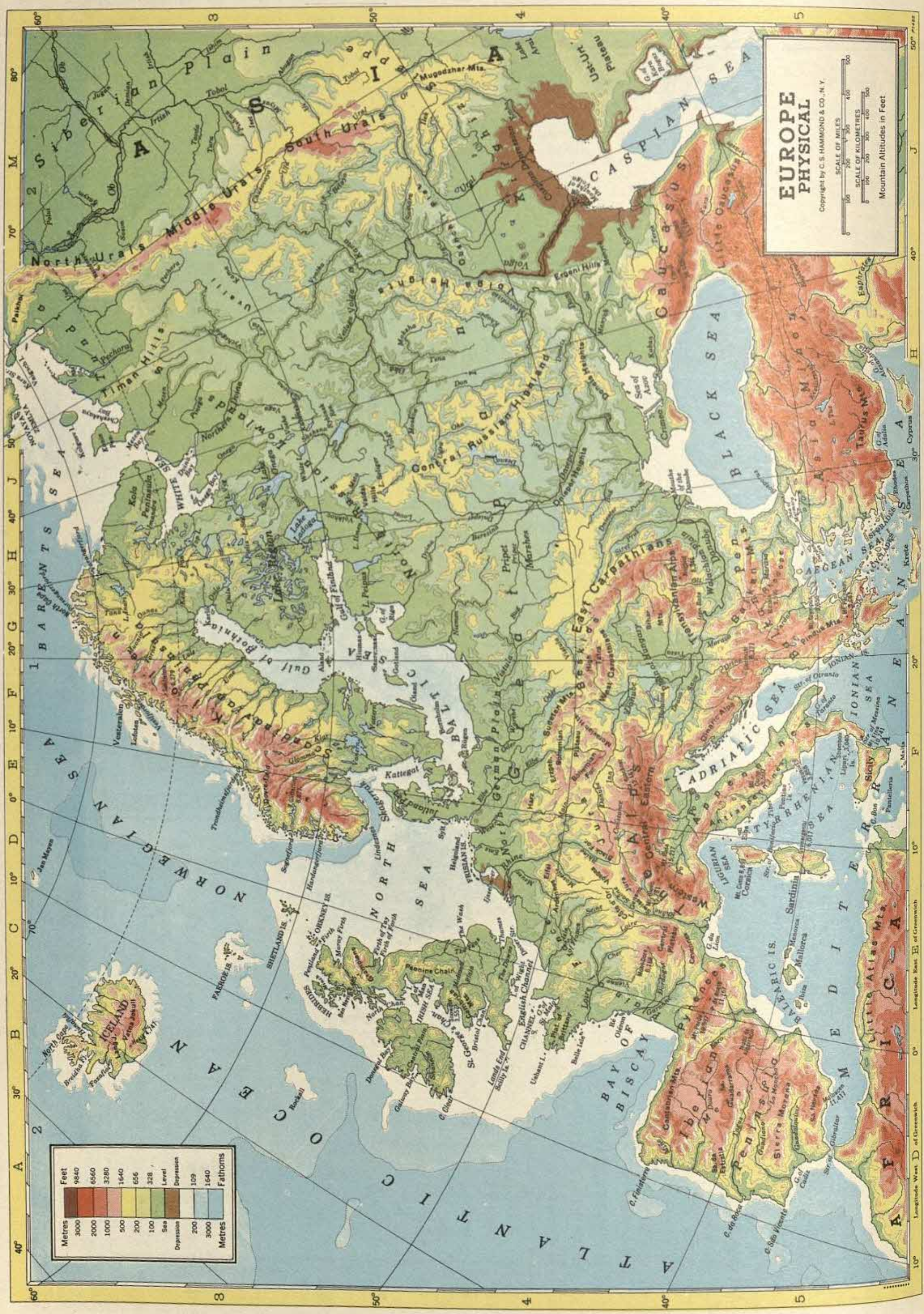
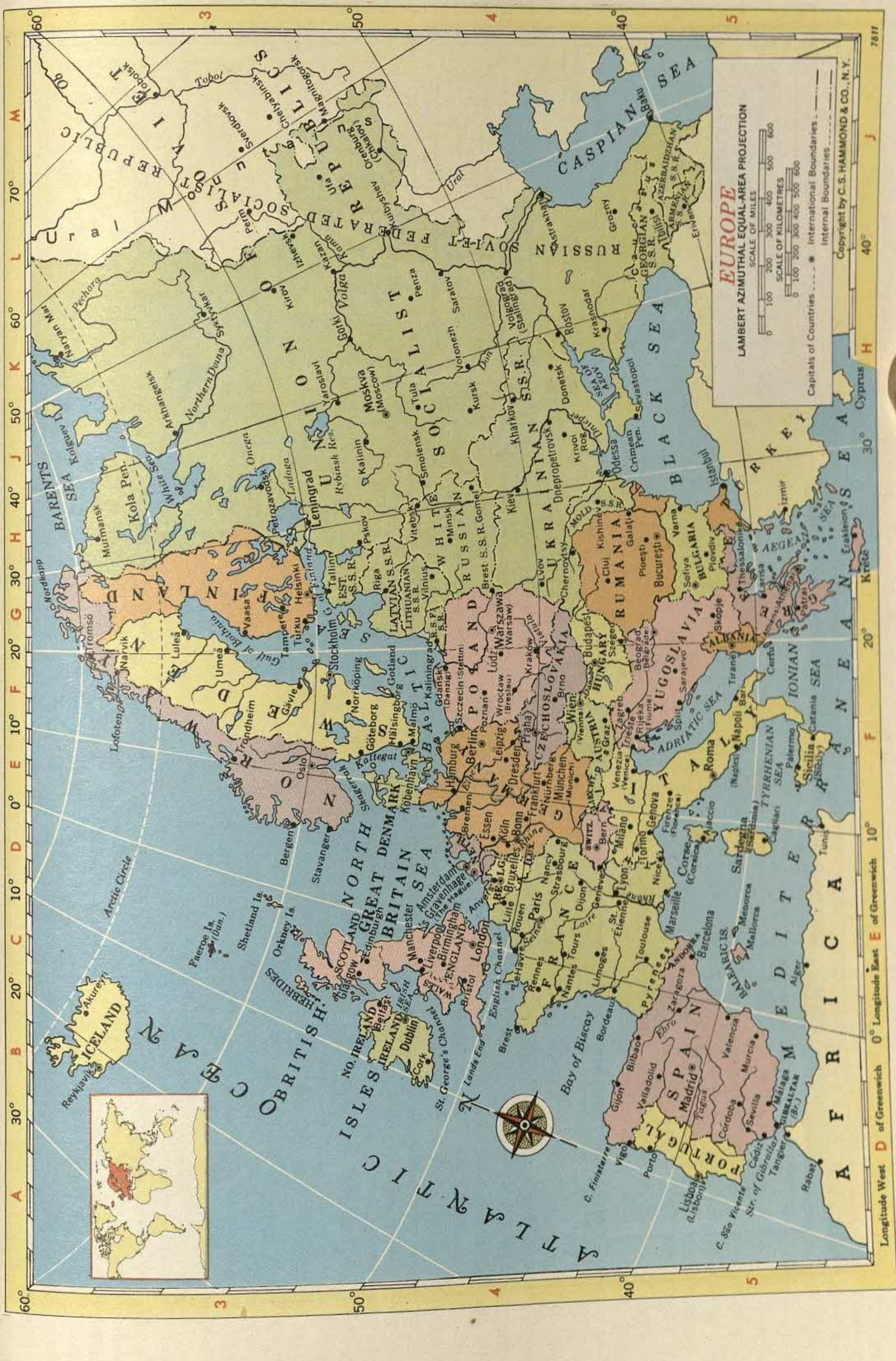
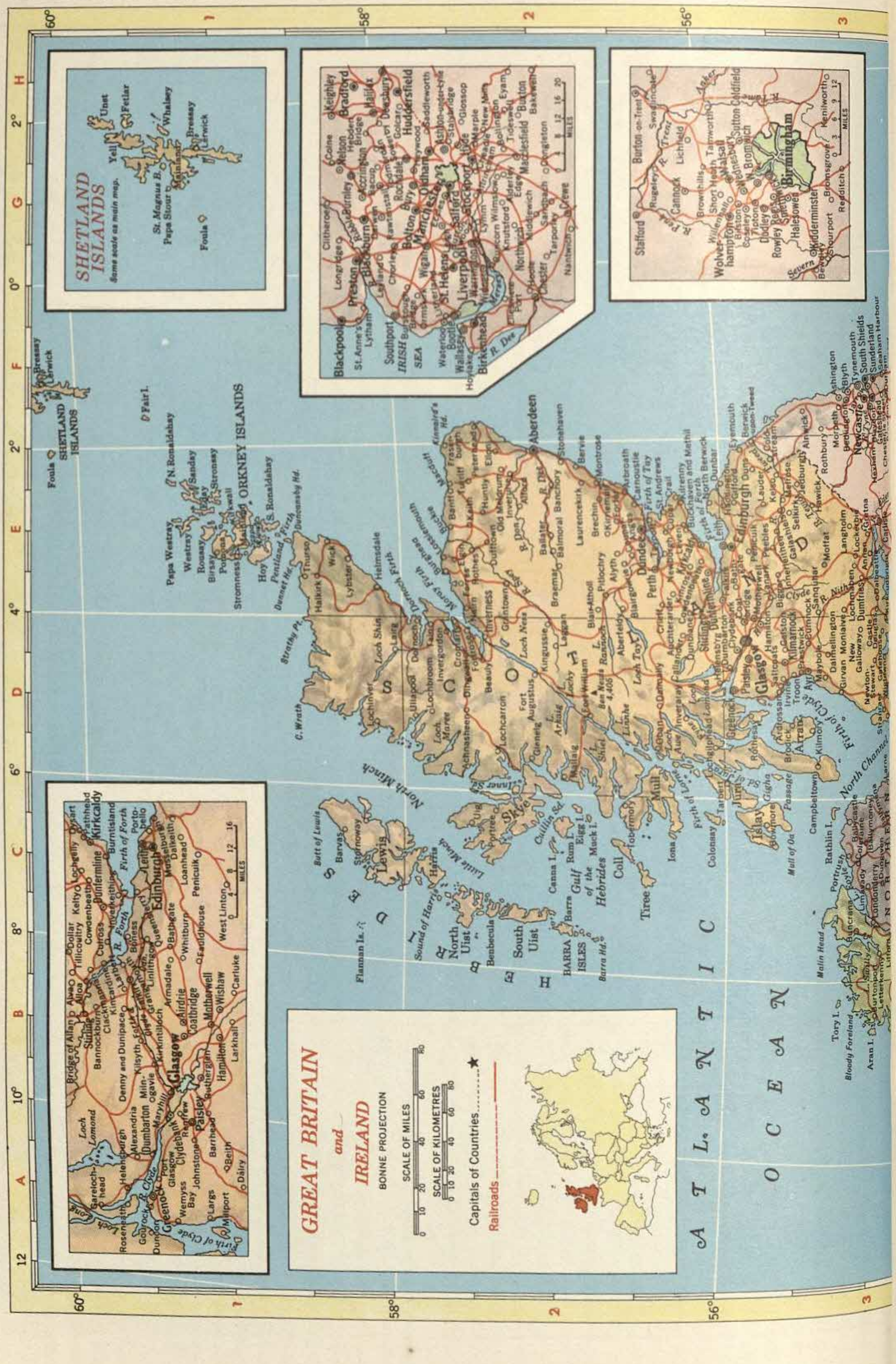
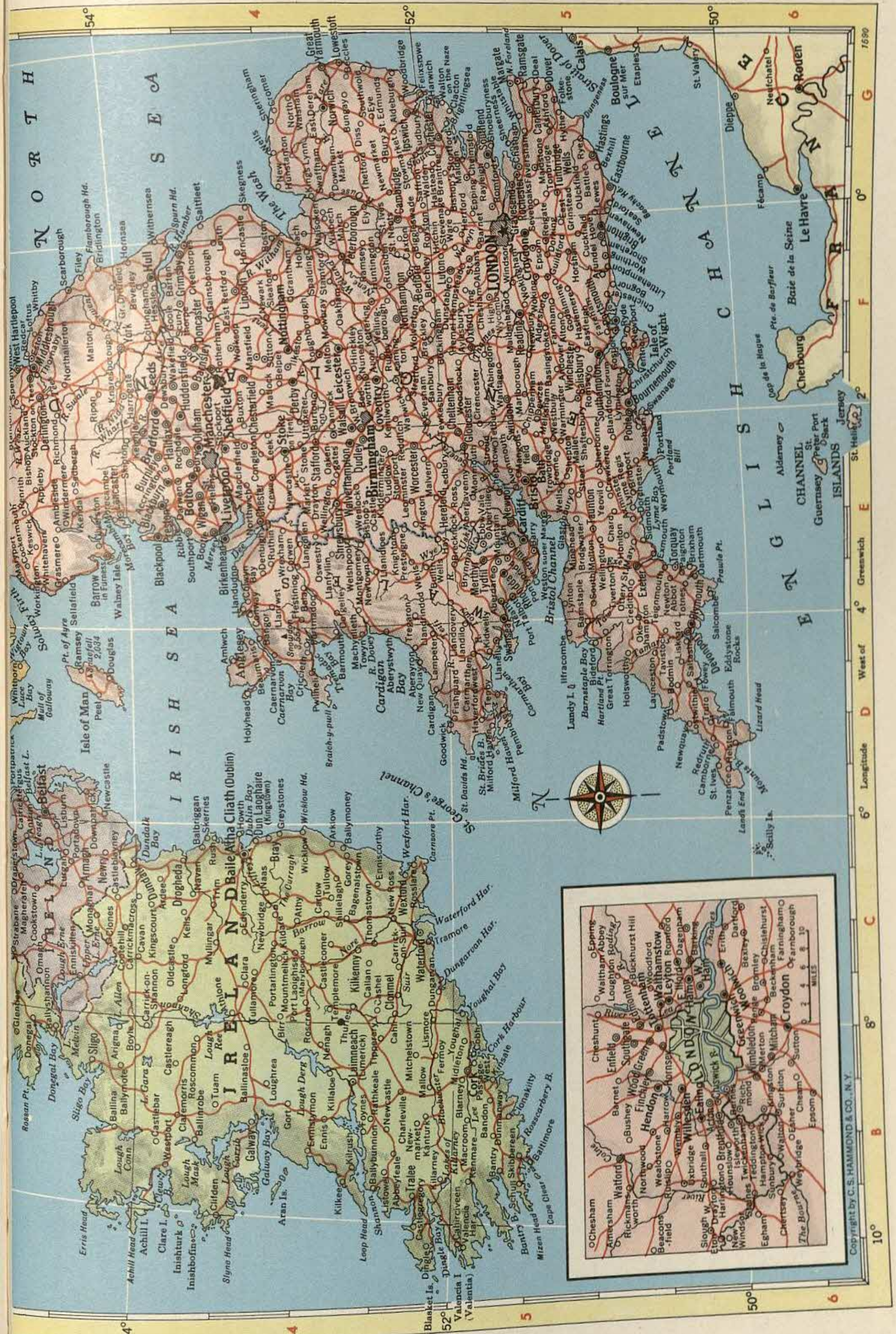

EUROPE
PHYSICAL
Copyright by C.S. HAMMOND & CO., N.Y.
SCALE OF MILES
SCALE OF KILOMETRES
Mountain Altitudes in Feet
Metres
Feet
3000
9840
2000
6560
1000
3280
500
1640
200
656
100
328
Sea
Level
Depression
Depression
200
109
3000
1640
Metres
Fathoms
ATLANTIC OCEAN
NORWEGIAN SEA
BARENTS SEA
NORTH SEA
BALTIC SEA
BAY OF BISCAY
MEDITERRANEAN SEA
ADRIATIC SEA
TYRRHENIAN SEA
IONIAN SEA
AEGEAN SEA
BLACK SEA
CASPIAN SEA
WHITE SEA
ICELAND
ASIA
AFRICA
Siberian Plain
North Urals
Middle Urals
South Urals
Mugodzhar Mts.
Timan Hills
Volga Heights
Central Russian Highland
Caucasus
Little Caucasus
Asia Minor
Taurus Mts.
Pripet Marshes
East Carpathians
Transylvanian Alps
Balkan Mts.
Pindus Mts.
Dinaric Alps
Apennines
Alps
Pyrenees
Iberian Peninsula
Sierra Morena
Cantabrian Mts.
Little Atlas Mts.
Lapland
Kola Peninsula
Lake Ladoga
Lake Onega
Gulf of Bothnia
Gulf of Finland
North German Plain
Sudeten Mts.
Pennine Chain
English Channel
Sea of Azov
Cyprus
Krete
Sicily
Sardinia
Corsica
Balearic Is.
Mallorca
Shetland Is.
Orkney Is.
Faeroe Is.
Hebrides
Jan Mayen
Rockall


EUROPE
LAMBERT AZIMUTHAL EQUAL-AREA PROJECTION
SCALE OF MILES
0 100 200 300 400 500 600
SCALE OF KILOMETRES
0 100 200 300 400 500 600
Capitals of Countries
International Boundaries
Internal Boundaries
Copyright by C.S. HAMMOND & CO., N.Y.
7811
Longitude West D of Greenwich 0° Longitude East E of Greenwich
A B C D E F G H J K L M
3 4 5
60° 50° 40° 30° 20° 10° 0° 10° 20° 30° 40° 50° 60° 70°
ATLANTIC OCEAN
BRITISH ISLES
NORTH SEA
BALTIC SEA
BARENTS SEA
White Sea
BLACK SEA
CASPIAN SEA
SEA OF AZOV
MEDITERRANEAN SEA
ADRIATIC SEA
TYRRHENIAN SEA
IONIAN SEA
AEGEAN SEA
Bay of Biscay
English Channel
St. George's Channel
IRISH SEA
Gulf of Bothnia
G. of Finland
Skagerrak
Kattegat
Str. of Gibraltar
Arctic Circle
ICELAND
Reykjavik
Akureyri
Faeroe Is. (Dan.)
Shetland Is.
Orkney Is.
HEBRIDES
NO. IRELAND
Belfast
IRELAND
Dublin
Cork
SCOTLAND
Glasgow
Edinburgh
GREAT BRITAIN
ENGLAND
WALES
Manchester
Liverpool
Birmingham
Bristol
London
Lands End
NORWAY
Nordkapp
Tromsö
Narvik
Lofoten Is.
Trondheim
Bergen
Stavanger
Oslo
SWEDEN
Luleå
Umeå
Gävle
Stockholm
Norrköping
Göteborg
Hälsingborg
Malmö
Gotland
FINLAND
Vaasa
Tampere
Turku
Helsinki
DENMARK
København
Murmansk
Kola Pen.
Kolguev I.
Naryan Mar
Pechora
Arkhangelsk
Northern Dvina
Onega
Petrozavodsk
Ladoga
Leningrad
Rybinsk Res.
Syktyvkar
UNION OF SOVIET SOCIALIST REPUBLICS
RUSSIAN SOVIET FEDERATED SOCIALIST REPUBLIC
Ural
Ural Mts.
Ob
Tobol
Tobolsk
Sverdlovsk
Chelyabinsk
Magnitogorsk
Perm
Ufa
Orenburg (Chkalov)
Izhevsk
Kirov
Kazan
Kama
Kuibyshev
Gorki
Volga
Yaroslavl
Kalinin
Moskva (Moscow)
Tula
Penza
Saratov
Voronezh
Kursk
Don
Volgograd (Stalingrad)
Astrakhan
Rostov
Krasnodar
Grozny
Caucasus
GEORGIAN S.S.R.
Tbilisi
ARMENIAN S.S.R.
Erivan
AZERBAIDZHAN S.S.R.
Baku
Smolensk
Pskov
Tallinn
EST. S.S.R.
Riga
LATVIAN S.S.R.
LITHUANIAN S.S.R.
Vilnius
Kaliningrad
R.S.F.S.R.
Vitebsk
Minsk
WHITE RUSSIAN S.S.R.
Gomel
Brest
Kiev
Kharkov
UKRAINIAN S.S.R.
Dnepropetrovsk
Dnieper
Krivoi Rog
Donetsk
Odessa
Crimean Pen.
Sevastopol
Lvov
Chernovtsy
MOLD. S.S.R.
Kishinev
POLAND
Gdańsk (Danzig)
Szczecin (Stettin)
Poznań
Lódz
Warszawa (Warsaw)
Wrocław (Breslau)
Kraków
Vistula
CZECHOSLOVAKIA
Praha
Brno
GERMANY
Hamburg
Bremen
Berlin
Elbe
Leipzig
Dresden
Essen
Köln
Bonn
Frankfurt
Nürnberg
München (Munich)
Rhine
NETH.
Amsterdam
's Gravenhage (The Hague)
BELG.
Antwerpen
Bruxelles
LUX.
FRANCE
Lille
Rouen
Le Havre
Seine
Paris
Brest
Rennes
Nantes
Tours
Loire
Nancy
Strasbourg
Dijon
Limoges
Bordeaux
Lyon
St. Étienne
Rhone
Toulouse
Marseille
Nice
Pyrenees
ANDORRA
SWITZ.
Bern
Genève
LIECHT.
AUSTRIA
Wien (Vienna)
Graz
Danube
HUNGARY
Budapest
Szeged
RUMANIA
Cluj
Ploești
București
Galați
BULGARIA
Sofiya
Plovdiv
Varna
YUGOSLAVIA
Zagreb
Rijeka (Fiume)
Beograd (Belgrade)
Sarajevo
Split
Skopje
ALBANIA
Tirane
GREECE
Thessaloniki
Larisa
Athens
Patrai
Corfu
Krete
Erakleion
TURKEY
Istanbul
Izmir
Cyprus
ITALY
Trieste
Venezia (Venice)
Milano
Torino
Genova
Firenze (Florence)
Roma
Napoli (Naples)
Bari
Palermo
Catania
Sicilia (Sicily)
Corse (Corsica)
Ajaccio
Sardegna (Sardinia)
Cagliari
Tunis
BALEARIC IS.
Menorca
Mallorca
SPAIN
Gijón
Bilbao
Valladolid
Zaragoza
Ebro
Barcelona
Madrid
Tagus
Valencia
Murcia
Córdoba
Sevilla
Málaga
GIBRALTAR (Br.)
PORTUGAL
C. Finisterre
Vigo
Porto
Lisboa (Lisbon)
C. São Vicente
Cádiz
Tangier
Rabat
Alger
AFRICA


GREAT BRITAIN
and
IRELAND
BONNE PROJECTION
SCALE OF MILES
SCALE OF KILOMETRES
Capitals of Countries
Railroads
SHETLAND ISLANDS
Same scale as main map.
ORKNEY ISLANDS
SHETLAND ISLANDS
SCOTLAND
HEBRIDES
ATLANTIC OCEAN
North Minch
Little Minch
Sea of the Hebrides
Moray Firth
Firth of Forth
Firth of Tay
Firth of Clyde
North Channel
Pentland Firth
IRISH SEA
Lewis
Skye
Mull
Islay
Jura
Arran
North Uist
South Uist
Tiree
Coll
Aberdeen
Inverness
Dundee
Perth
Edinburgh
Glasgow
Paisley
Greenock
Stirling
Newcastle
Liverpool
Manchester
Birmingham
Preston
Blackpool
Bradford
Huddersfield
Oldham
Bolton
Birkenhead
Wolverhampton
Kirkcaldy
Dunfermline
Motherwell
Hamilton
60°
58°
56°
12
10°
8°
6°
4°
2°
0°
A
B
C
D
E
F
G
H
1
2
3


NORTH SEA
IRISH SEA
ENGLISH CHANNEL
St. George's Channel
Bristol Channel
Strait of Dover
IRELAND
ENGLAND
WALES
FRANCE
CHANNEL ISLANDS
Isle of Man
Isle of Wight
Anglesey
Cardigan Bay
The Wash
Galway Bay
Donegal Bay
Dublin Bay
LONDON
Baile Átha Cliath (Dublin)
Belfast
Birmingham
Manchester
Liverpool
Leeds
Sheffield
Bristol
Cardiff
Nottingham
Leicester
Coventry
Plymouth
Southampton
Portsmouth
Brighton
Norwich
Hull
Cork
Limerick
Galway
Waterford
Le Havre
Calais
Boulogne
Cherbourg
Greenwich
West of
Longitude
54°
52°
50°
10°
8°
6°
4°
2°
0°
B
C
D
E
F
G
4
5
6
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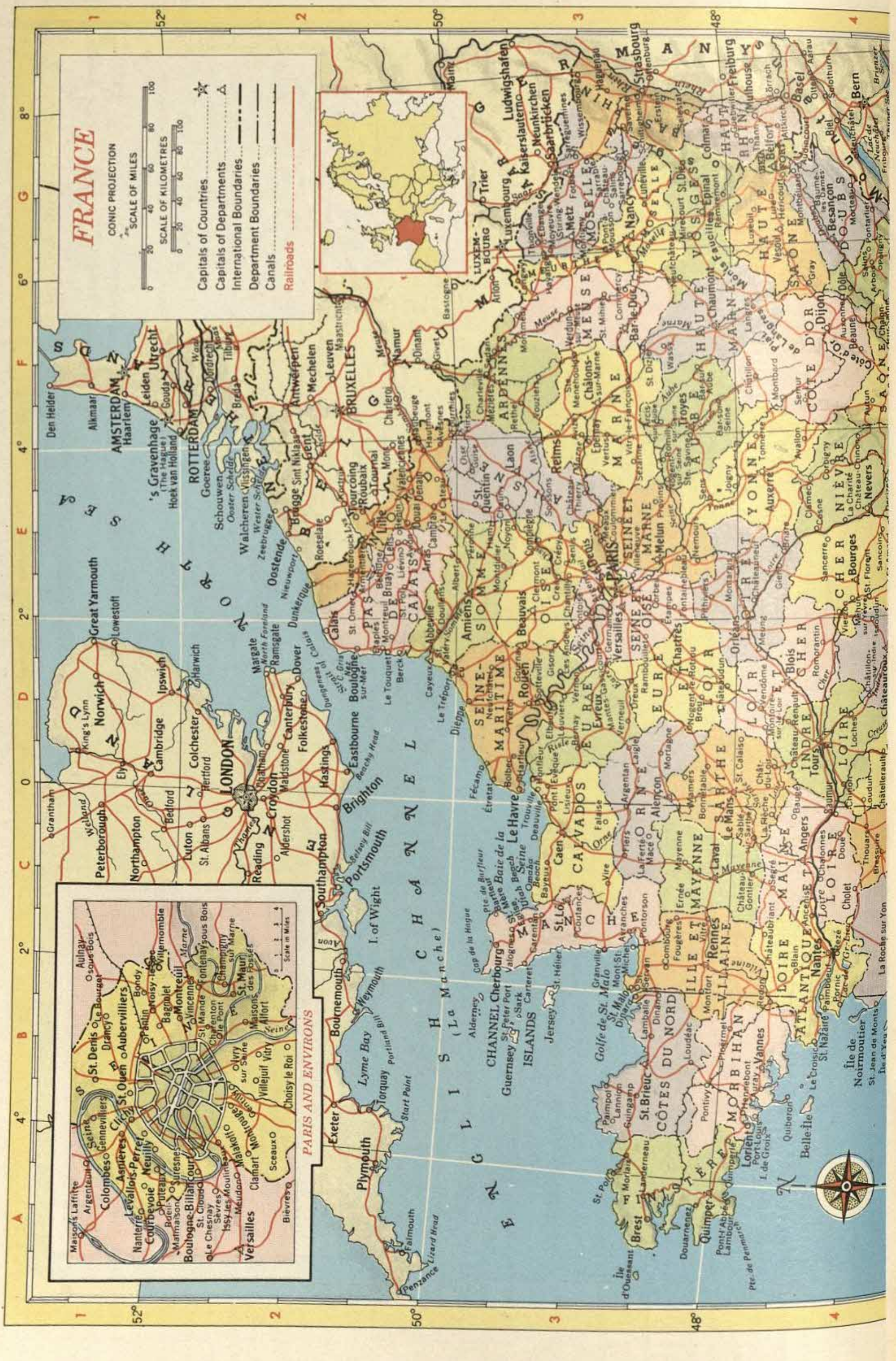
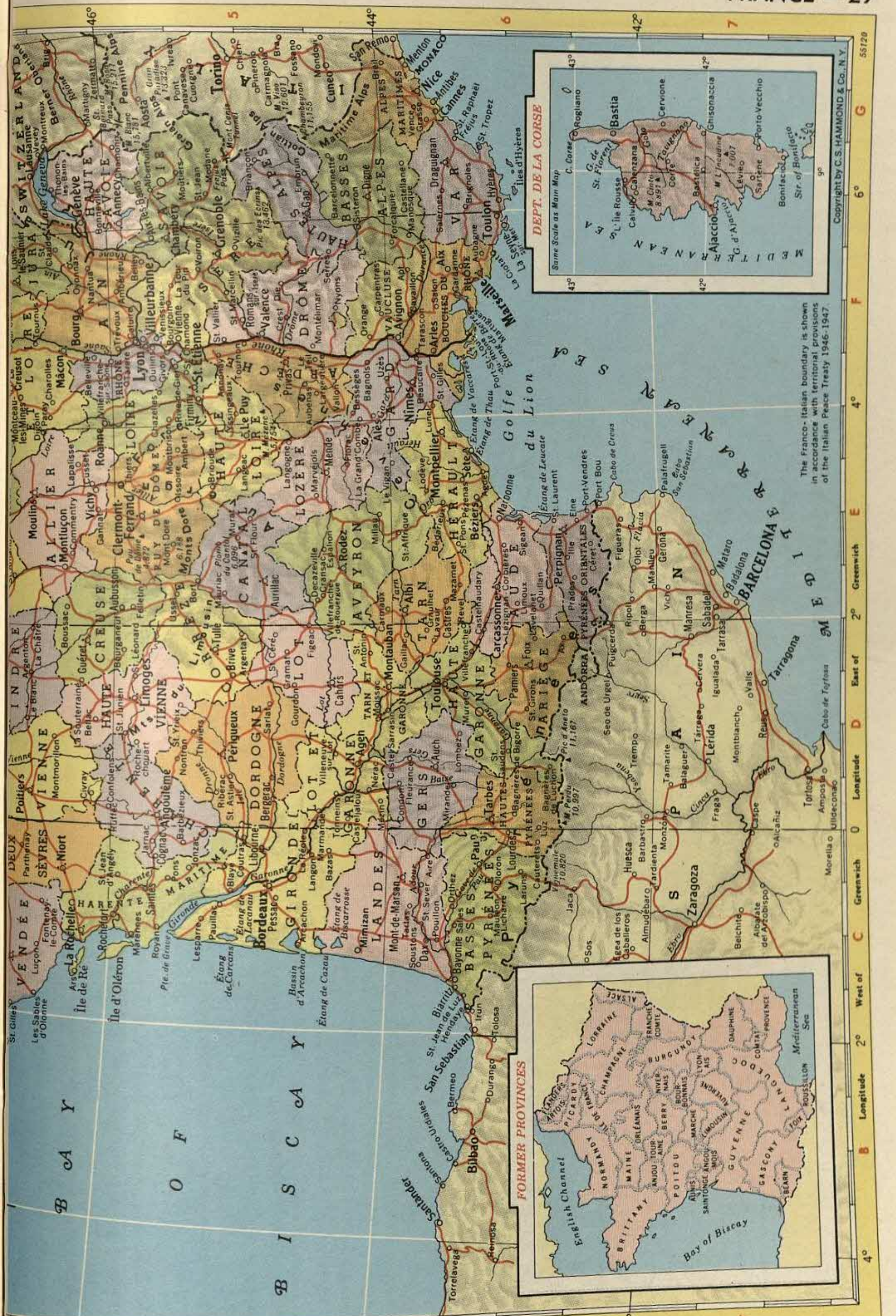

FRANCE
CONIC PROJECTION
SCALE OF MILES
0 20 40 60 80 100
SCALE OF KILOMETRES
0 20 40 60 80 100
Capitals of Countries
Capitals of Departments
International Boundaries
Department Boundaries
Canals
Railroads
PARIS AND ENVIRONS
Scale in Miles
NORTH SEA
ENGLISH CHANNEL
(La Manche)
CHANNEL ISLANDS
ENGLAND
NETHERLANDS
BELGIUM
LUXEMBOURG
GERMANY
SWITZERLAND
LONDON
AMSTERDAM
BRUXELLES
PARIS
LUXEMBOURG
Bern
Strasbourg
Rouen
Le Havre
Cherbourg
Caen
Brest
Rennes
Nantes
Tours
Orléans
Reims
Amiens
Lille
Dijon
Nancy
Metz
Besançon
Bourges
Nevers
Angers
Le Mans
Chartres
Versailles
Troyes
Calais
Dunkerque
Boulogne
Dover
Southampton
Portsmouth
Brighton
Plymouth
Exeter
Jersey
Guernsey
Alderney
I. of Wight
Belle-Île
Île d'Ouessant
Île de Noirmoutier
SEINE-MARITIME
CALVADOS
MANCHE
FINISTÈRE
CÔTES DU NORD
MORBIHAN
ILLE ET VILAINE
MAYENNE
SARTHE
ORNE
EURE
EURE ET LOIR
OISE
SOMME
PAS DE CALAIS
NORD
AISNE
ARDENNES
MARNE
MEUSE
MOSELLE
MEURTHE ET MOSELLE
BAS RHIN
HAUT RHIN
VOSGES
HAUTE MARNE
HAUTE SAÔNE
DOUBS
CÔTE D'OR
AUBE
YONNE
NIÈVRE
CHER
LOIRET
LOIR ET CHER
INDRE
INDRE ET LOIRE
MAINE ET LOIRE
LOIRE ATLANTIQUE
SEINE ET MARNE
SEINE ET OISE
SAÔNE ET LOIRE
1 2 3 4
A B C D E F G
52° 50° 48°
4° 2° 0 2° 4° 6° 8°



The Franco-Italian boundary is shown in accordance with territorial provisions of the Italian Peace Treaty 1946-1947.

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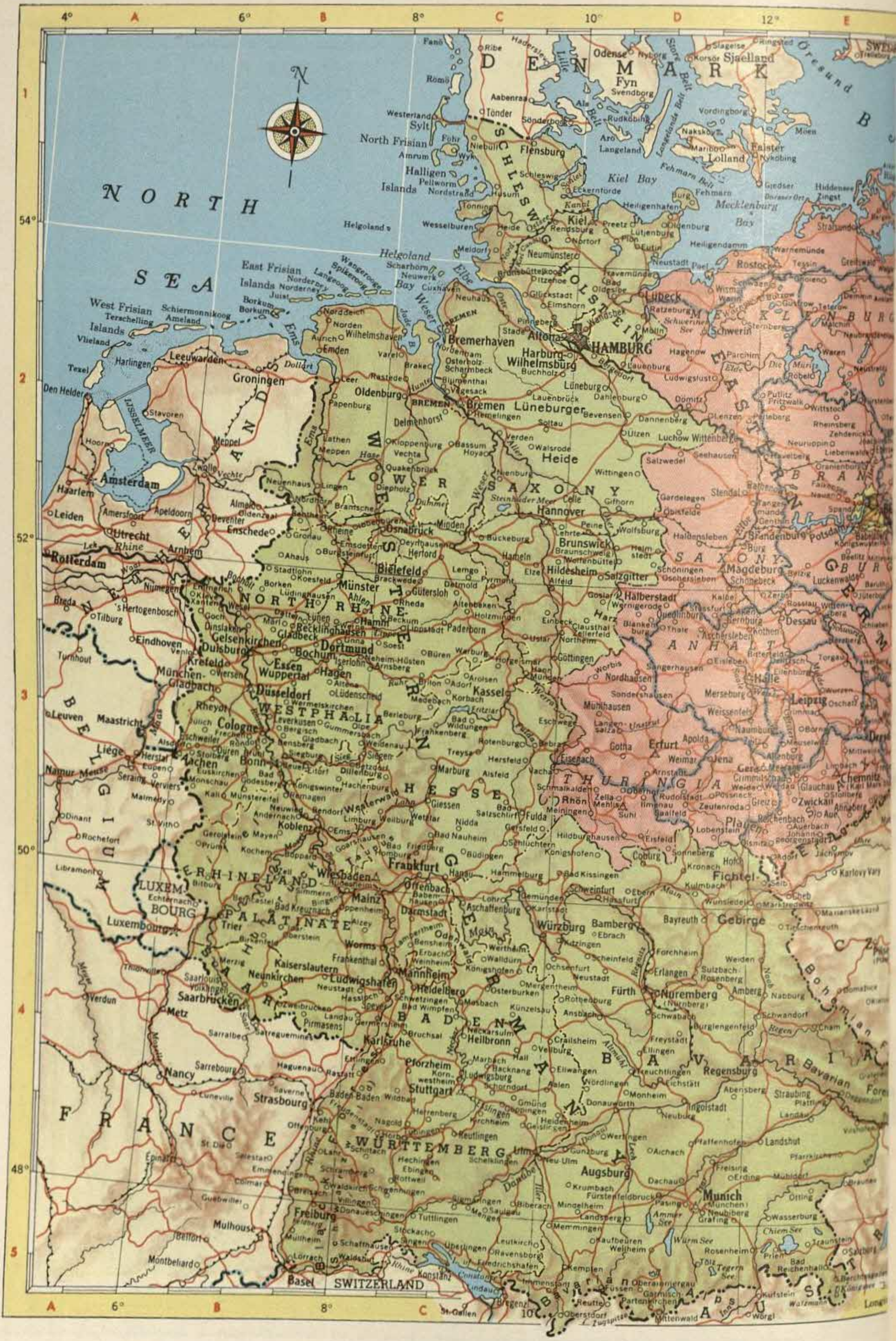
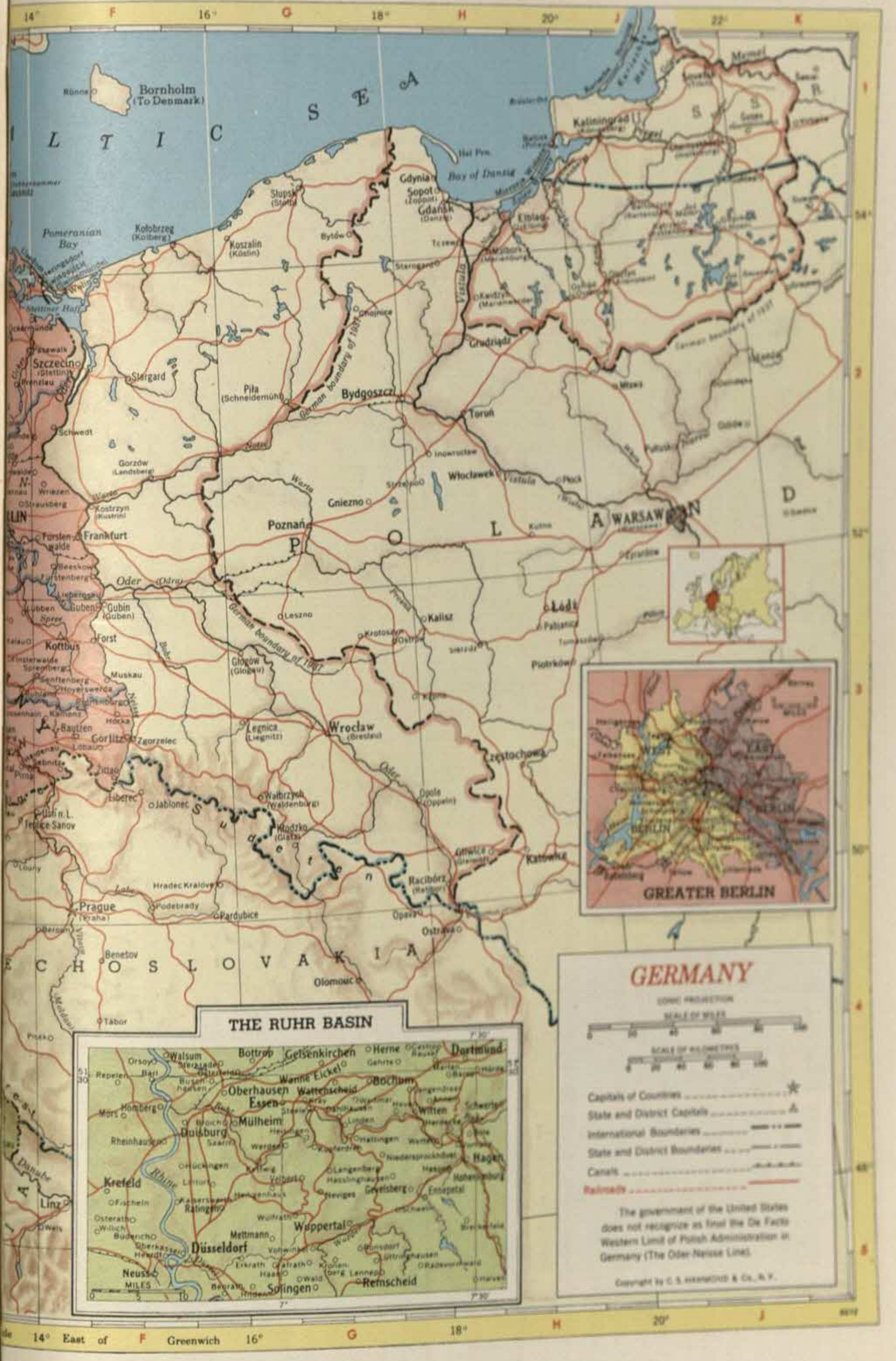
55120


4°
6°
8°
10°
12°
A
B
C
D
E
1
2
3
4
5
54°
52°
50°
48°
N
NORTH SEA
DENMARK
Fyn
Sjælland
Lolland
Kiel Bay
Mecklenburg Bay
Helgoland Bay
North Frisian Islands
East Frisian Islands
West Frisian Islands
Sylt
Helgoland
Fehmarn
Copenhagen
Odense
Flensburg
Schleswig
Kiel
Neumünster
Lübeck
SCHLESWIG-HOLSTEIN
HAMBURG
Altona
Harburg-Wilhelmsburg
Bremerhaven
Cuxhaven
Wilhelmshaven
Emden
Oldenburg
BREMEN
Bremen
Lüneburg
Lüneburger Heide
LOWER SAXONY
Hannover
Celle
Brunswick
Wolfsburg
Hildesheim
Salzgitter
Osnabrück
Minden
Bielefeld
Hameln
Göttingen
Goslar
Harz
Rostock
Wismar
Schwerin
Stralsund
Greifswald
MECKLENBURG
EAST GERMANY
BRANDENBURG
Berlin
Potsdam
Magdeburg
Halberstadt
SAXONY-ANHALT
Dessau
Halle
Leipzig
Merseburg
Erfurt
Weimar
Jena
Gotha
Eisenach
THURINGIA
Gera
Chemnitz
Zwickau
Plauen
Dresden
NETHERLANDS
Amsterdam
Rotterdam
Utrecht
Haarlem
Leiden
Groningen
Leeuwarden
Arnhem
Nijmegen
Zwolle
Enschede
IJSSELMEER
Den Helder
Texel
Rhine
NORTH RHINE-WESTPHALIA
Münster
Gelsenkirchen
Recklinghausen
Dortmund
Bochum
Essen
Duisburg
Krefeld
München-Gladbach
Düsseldorf
Wuppertal
Hagen
Cologne
Bonn
Aachen
Paderborn
Kassel
BELGIUM
Liège
Maastricht
Namur
Leuven
LUXEMBOURG
Luxembourg
HESSE
Marburg
Giessen
Fulda
Frankfurt
Wiesbaden
Offenbach
Darmstadt
RHINELAND-PALATINATE
Koblenz
Mainz
Trier
Worms
Kaiserslautern
Ludwigshafen
SAAR
Saarbrücken
Mannheim
Heidelberg
Karlsruhe
Heilbronn
Pforzheim
Stuttgart
Ulm
BADEN-WÜRTTEMBERG
Freiburg
Konstanz
Bodensee
Würzburg
Bamberg
Bayreuth
Fichtel-Gebirge
Erlangen
Fürth
Nuremberg (Nürnberg)
Regensburg
Ingolstadt
Augsburg
Munich (München)
Landshut
BAVARIA
Bavarian Forest
Bohemian Forest
Danube
Main
Elbe
Weser
Ems
Bavarian Alps
Zugspitze
Garmisch-Partenkirchen
Berchtesgaden
Salzburg
AUSTRIA
Innsbruck
SWITZERLAND
Basel
St. Gallen
FRANCE
Strasbourg
Metz
Nancy
Mulhouse
Colmar
Belfort
Verdun
Karlovy Vary
CZECHOSLOVAKIA



GERMANY

CONIC PROJECTION

SCALE OF MILES

SCALE OF KILOMETRES

Capitals of Countries ★
State and District Capitals
International Boundaries
State and District Boundaries
Canals
Railroads

The government of the United States does not recognize as final the De Facto Western Limit of Polish Administration in Germany (The Oder-Neisse Line).

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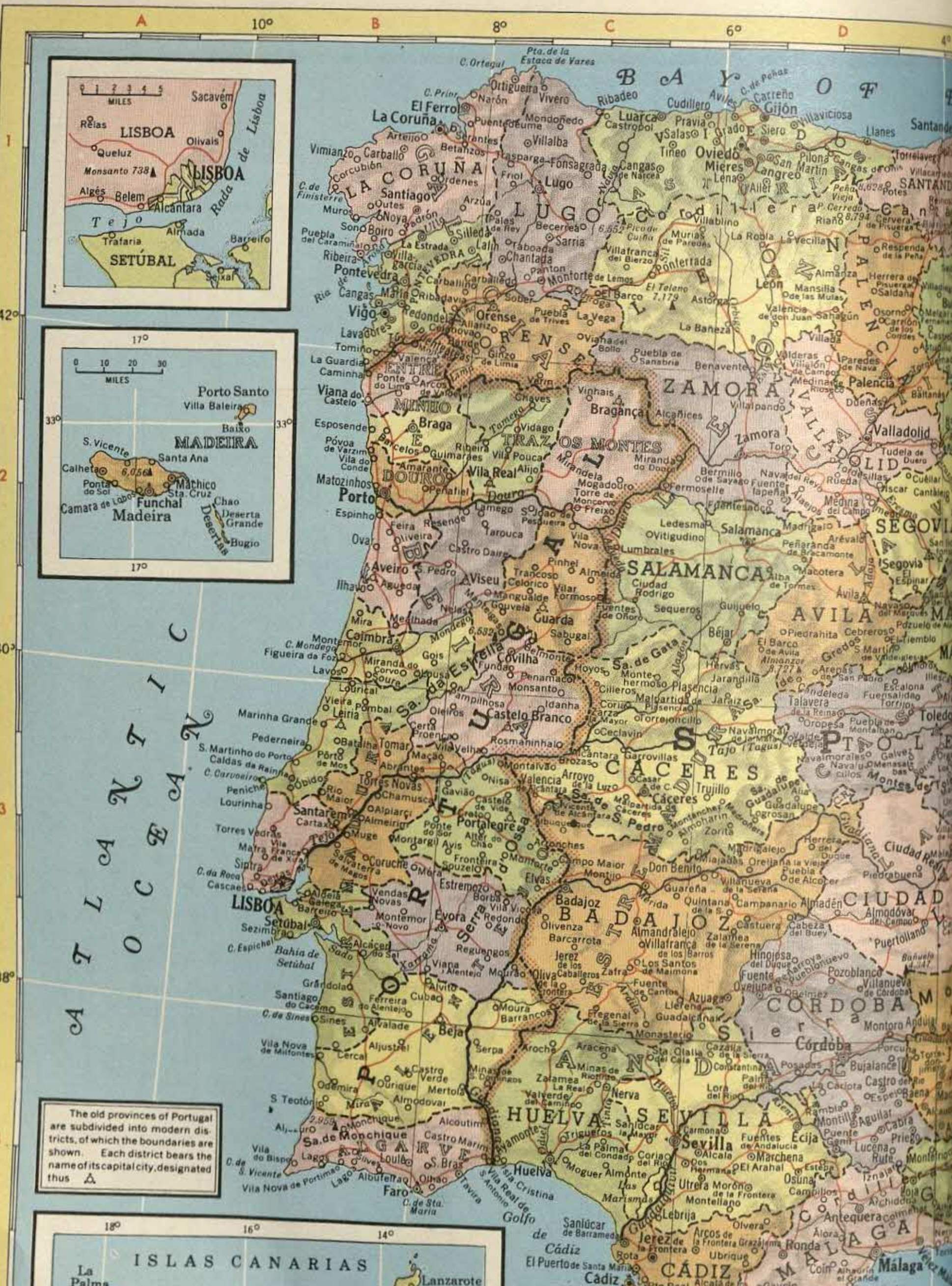
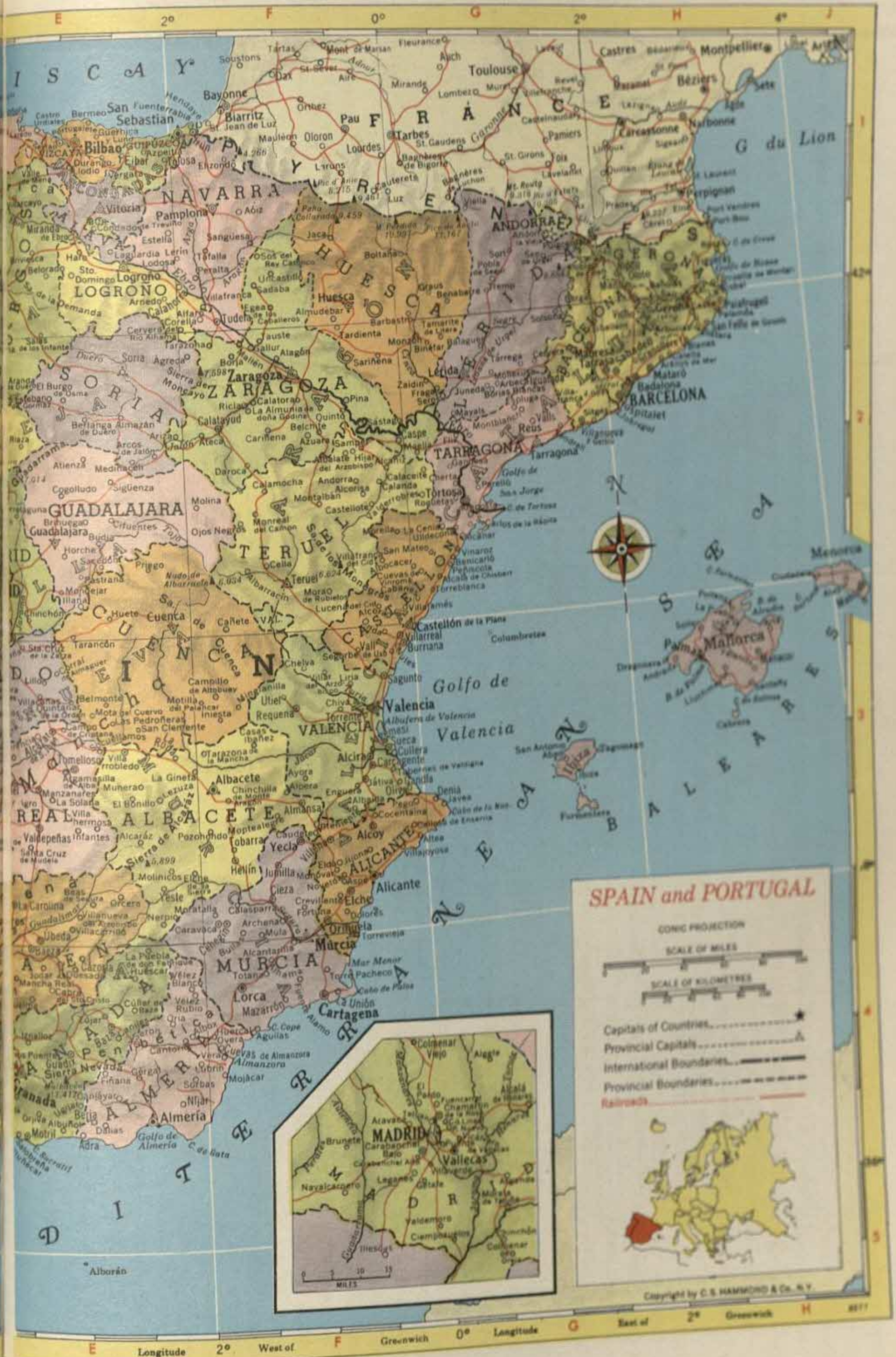
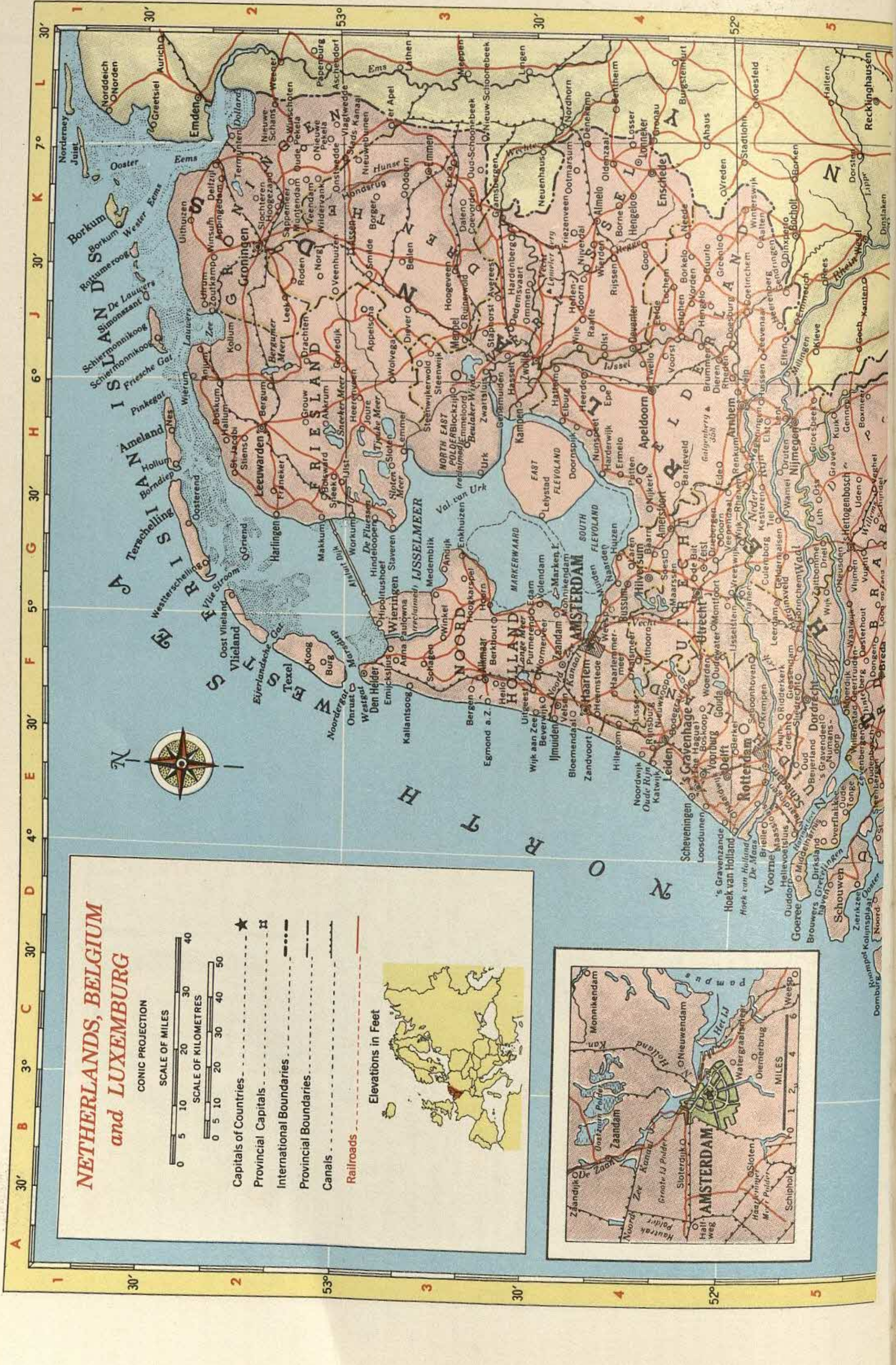
32 — SPAIN, PORTUGAL

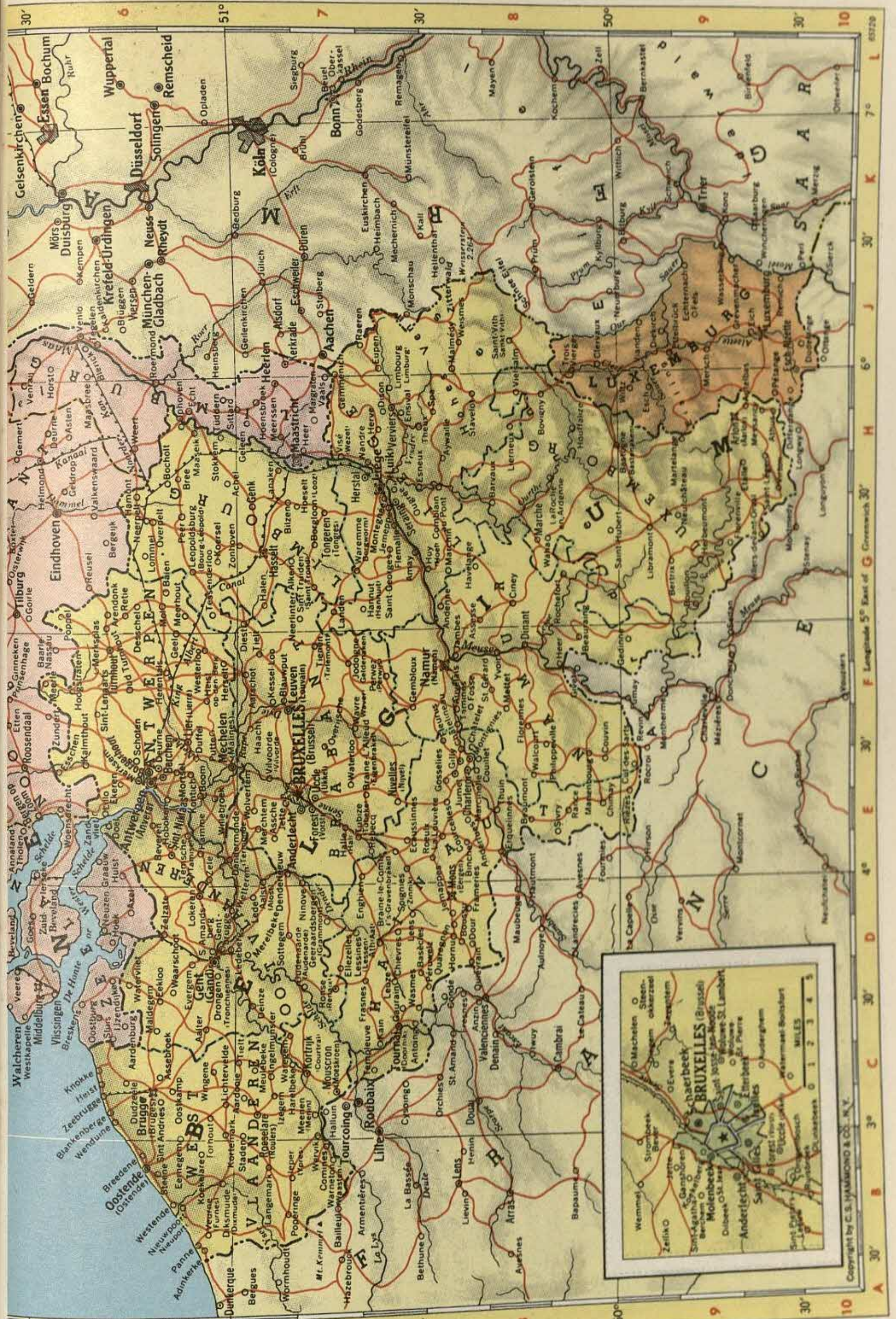


The old provinces of Portugal are subdivided into modern districts, of which the boundaries are shown. Each district bears the name of its capital city, designated thus △

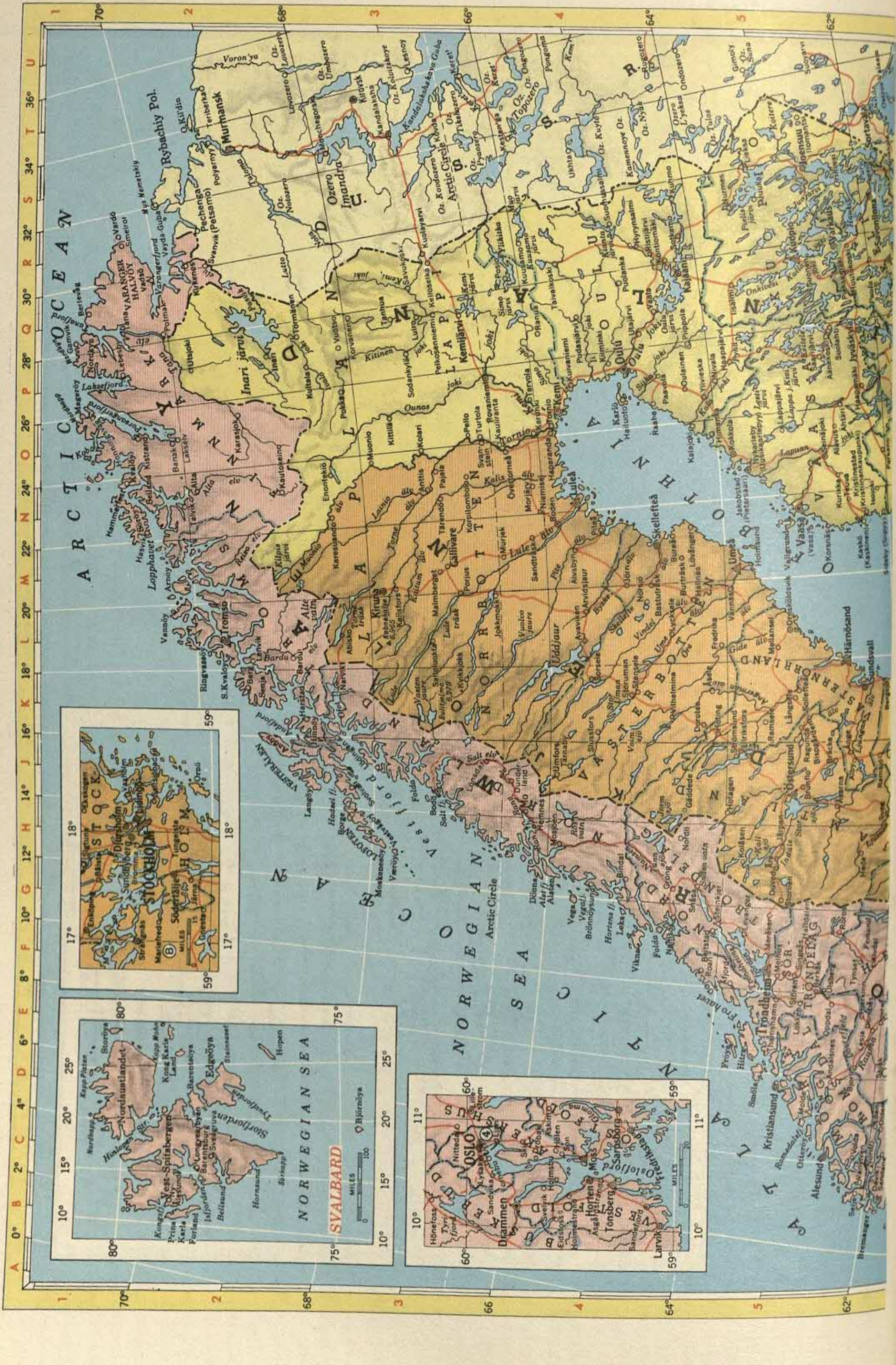

SPAIN and PORTUGAL
CONIC PROJECTION
SCALE OF MILES
SCALE OF KILOMETRES
Capitals of Countries ★
Provincial Capitals
International Boundaries
Provincial Boundaries
Railroads
Copyright by C.S. HAMMOND & Co. N.Y.
BISCAY
FRANCE
PYRENEES
G. du Lion
MEDITERRANEAN SEA
BALEARES
Golfo de Valencia
NAVARRA
HUESCA
LERIDA
GERONA
BARCELONA
TARRAGONA
LOGROÑO
SORIA
ZARAGOZA
GUADALAJARA
TERUEL
CASTELLON
CUENCA
VALENCIA
ALBACETE
ALICANTE
MURCIA
ALMERIA
GRANADA
REAL
Bilbao
San Sebastian
Pamplona
Zaragoza
Barcelona
Tarragona
Valencia
Alicante
Murcia
Cartagena
Almería
Toulouse
ANDORRA
Mallorca
Menorca
Ibiza
Formentera
Palma
MADRID
Vallecas
Greenwich
Longitude
West of
East of

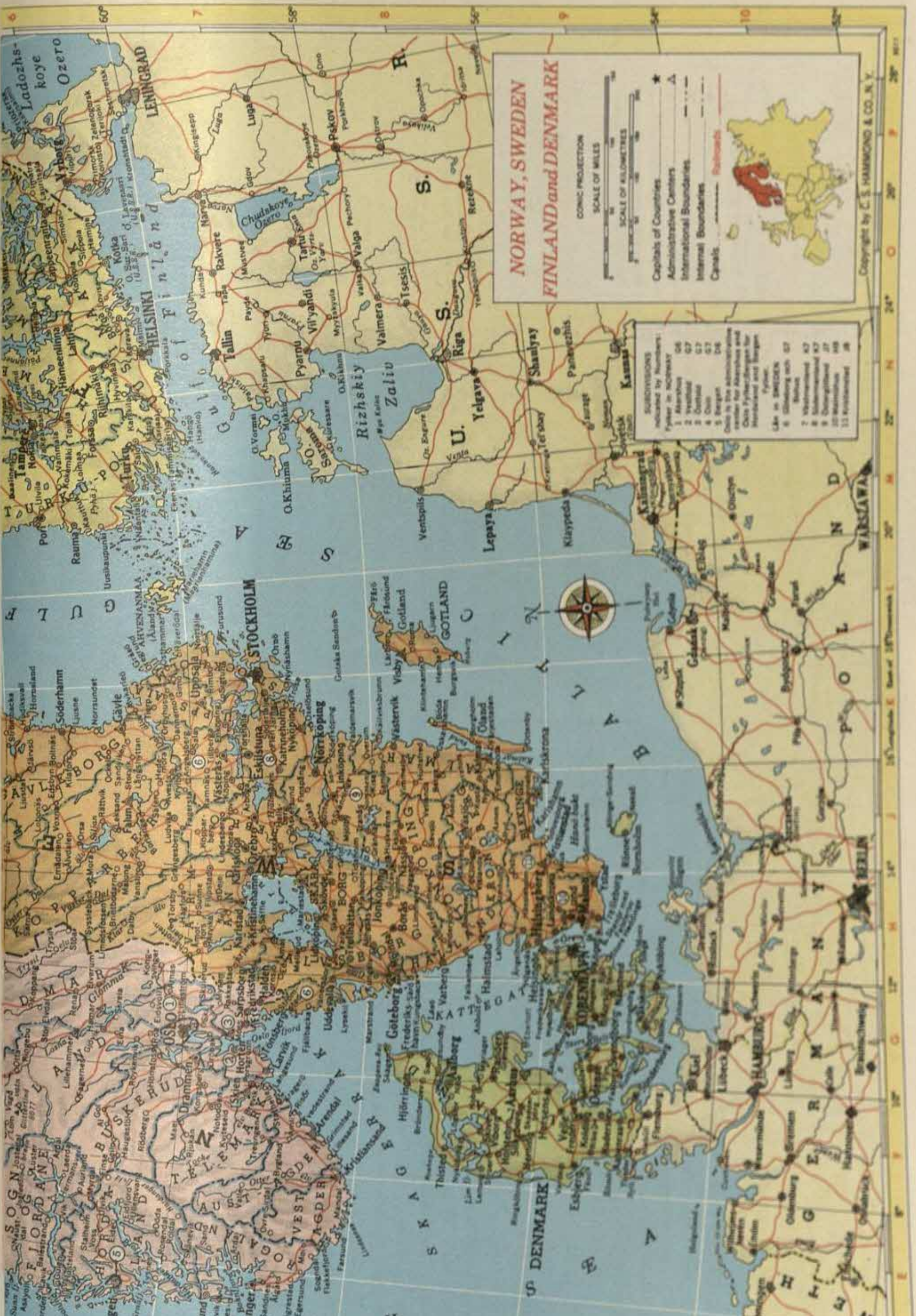
34 — NETHERLANDS, BELGIUM, LUXEMBURG

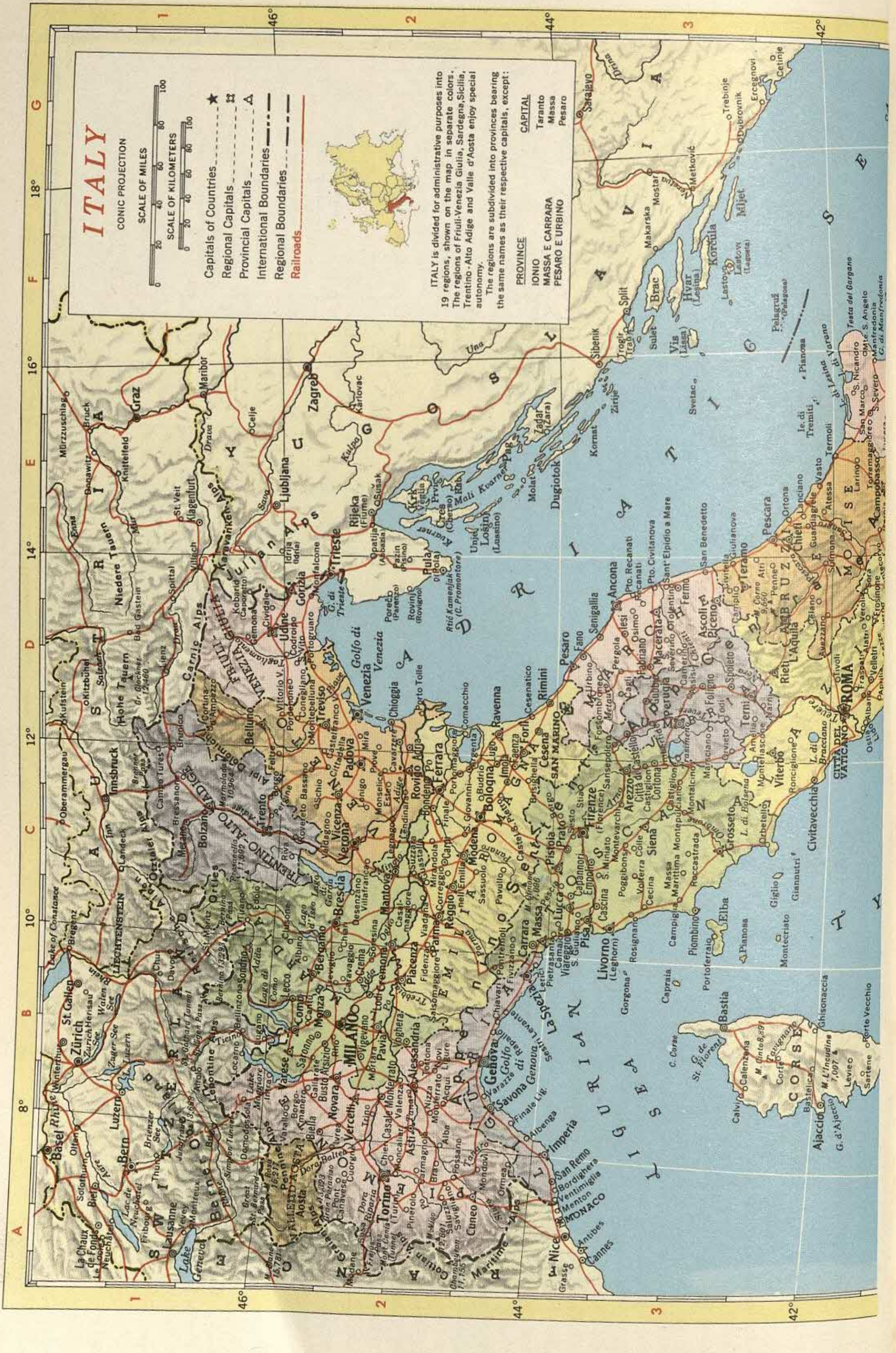



NETHERLANDS
BELGIUM
LUXEMBURG
GERMANY
FRANCE
SAAR
ZEELAND
WEST VLAANDEREN
OOST VLAANDEREN
ANTWERPEN
LIMBURG
BRABANT
HAINAUT
NAMUR
LIÈGE
LUXEMBOURG
BRUXELLES (Brussel)
Antwerpen (Anvers)
Gent (Gand)
Brugge (Bruges)
Oostende (Ostende)
Liège (Luik)
Namur (Namen)
Leuven (Louvain)
Mechelen (Malines)
Maastricht
Eindhoven
Tilburg
Aachen
Köln (Cologne)
Düsseldorf
Essen
Bochum
Duisburg
Wuppertal
Bonn
Trier
Luxemburg
Lille
Roubaix
Tourcoing
Valenciennes
Cambrai
Arras
Dunkerque
Meuse
Rhein
Scheldt
Copyright by C. S. HAMMOND & CO., N.Y.
Longitude 5° East of Greenwich 30'
MILES
0 1 2 3 4 5
A B C D E F G H J K L
6 7 8 9 10
51° 50°
3° 4° 5° 6° 7°

36 — NORWAY, SWEDEN, FINLAND, DENMARK



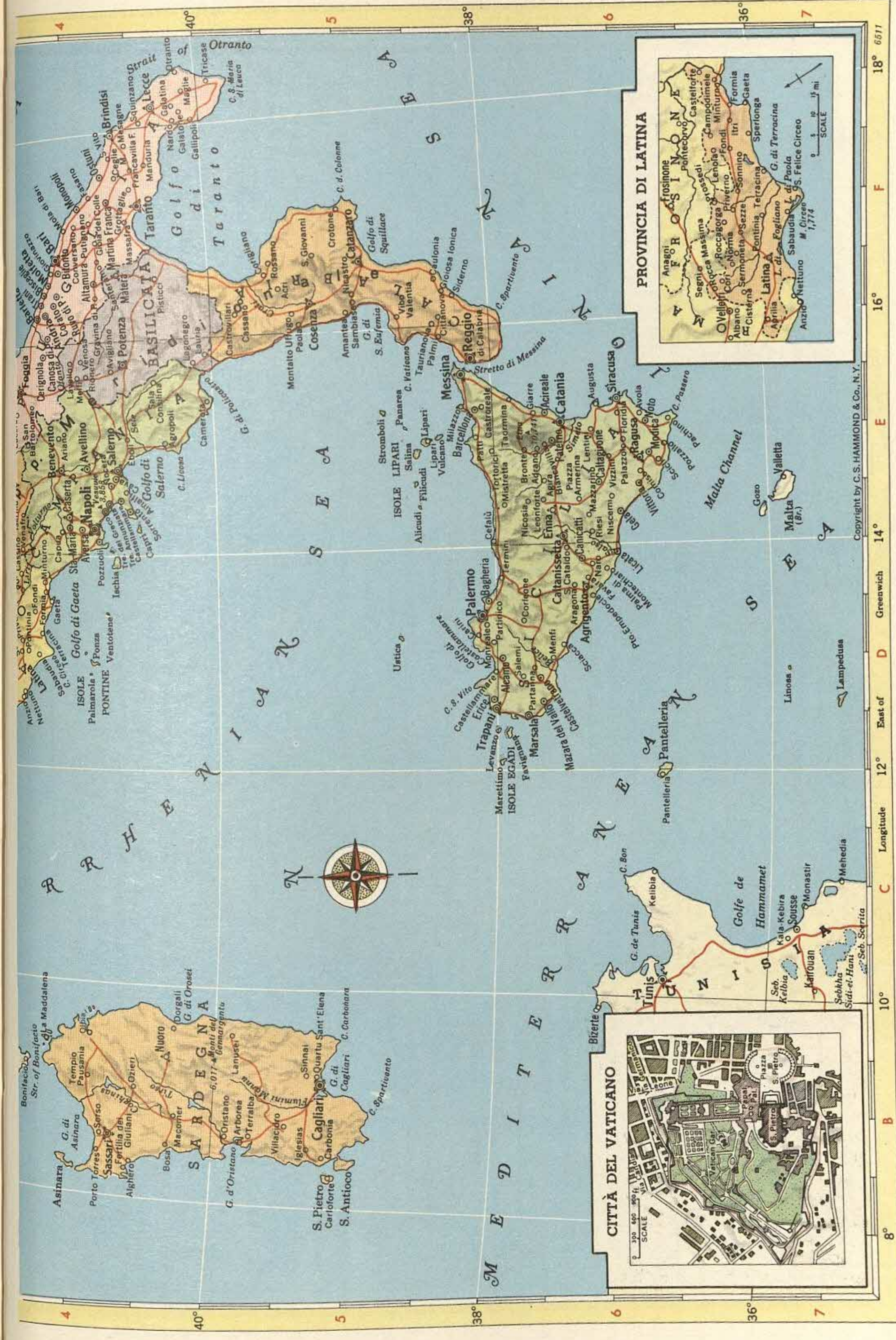

NORWAY, SWEDEN
FINLAND and DENMARK
CONIC PROJECTION
SCALE OF MILES
SCALE OF KILOMETRES
Capitals of Countries ★
Administrative Centers
International Boundaries
Internal Boundaries
Canals
Railroads
SUBDIVISIONS
Copyright by C. S. HAMMOND & CO., N.Y.
OSLO
STOCKHOLM
HELSINKI
LENINGRAD
KØBENHAVN
BERLIN
WARSZAWA
HAMBURG
DENMARK
GULF OF FINLAND
BALTIC SEA
SKAGERRAK
KATTEGAT
NORTH SEA
Rizhskiy Zaliv
GOTLAND
Ladozhskoye Ozero
Chudskoye Ozero
Tallin
Riga
Göteborg
Bergen
Stavanger
Kristiansand
Turku
Tampere
U. S. S. R.
POLAND
GERMANY



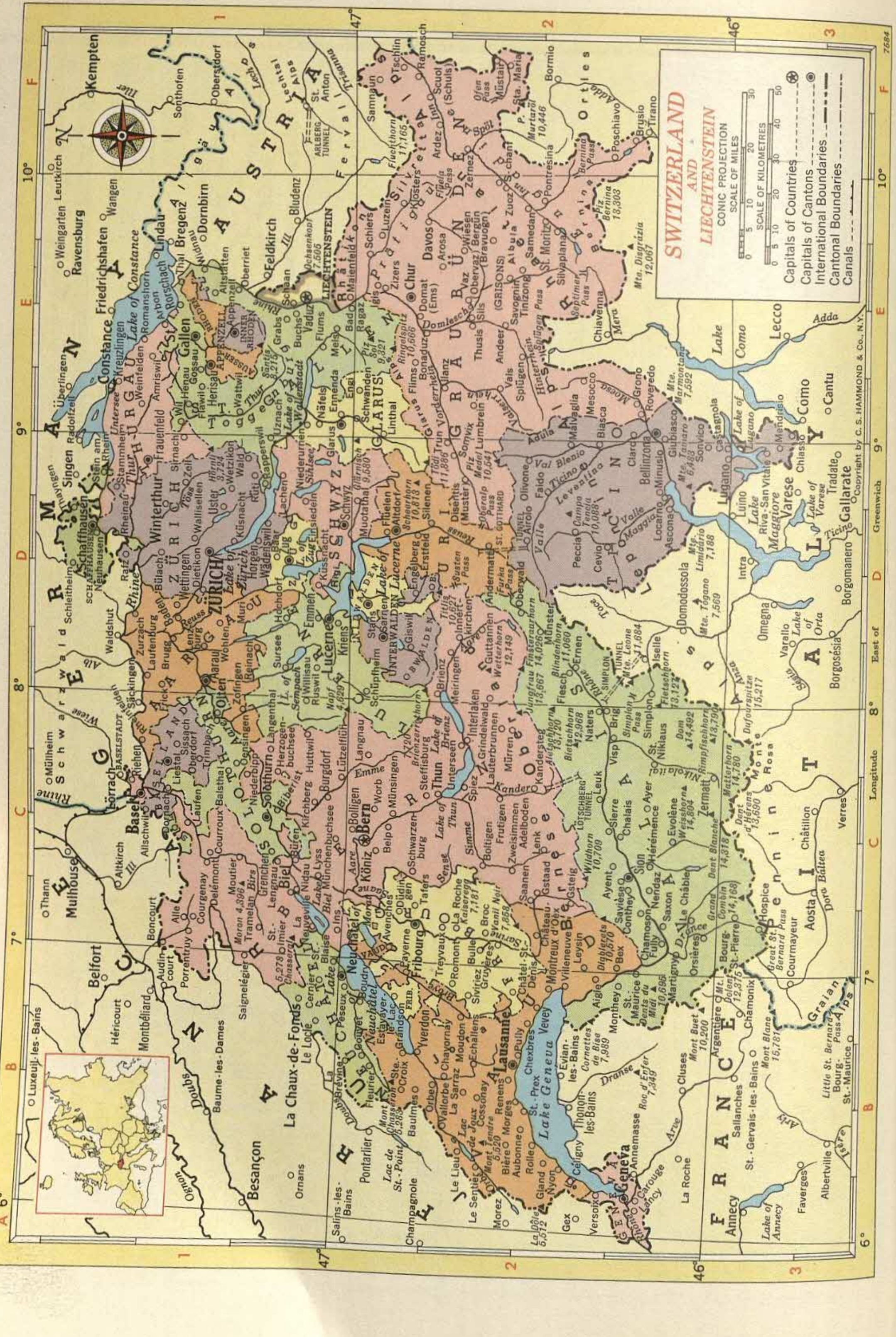
ITALY is divided for administrative purposes into 19 regions, shown on the map in separate colors. The regions of Friuli-Venezia Giulia, Sardegna, Sicilia, Trentino-Alto Adige and Valle d'Aosta enjoy special autonomy.

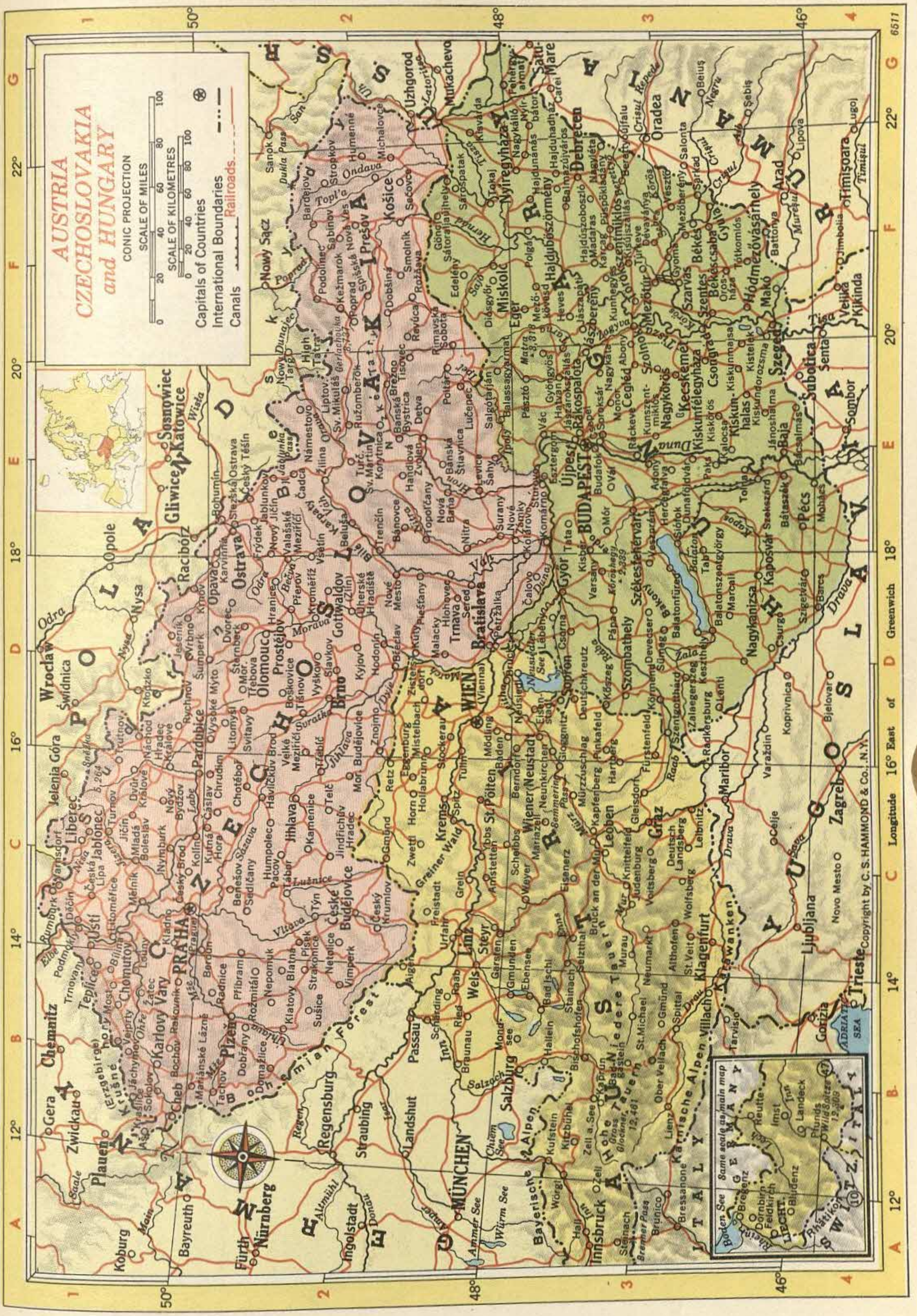
The regions are subdivided into provinces bearing the same names as their respective capitals, except:

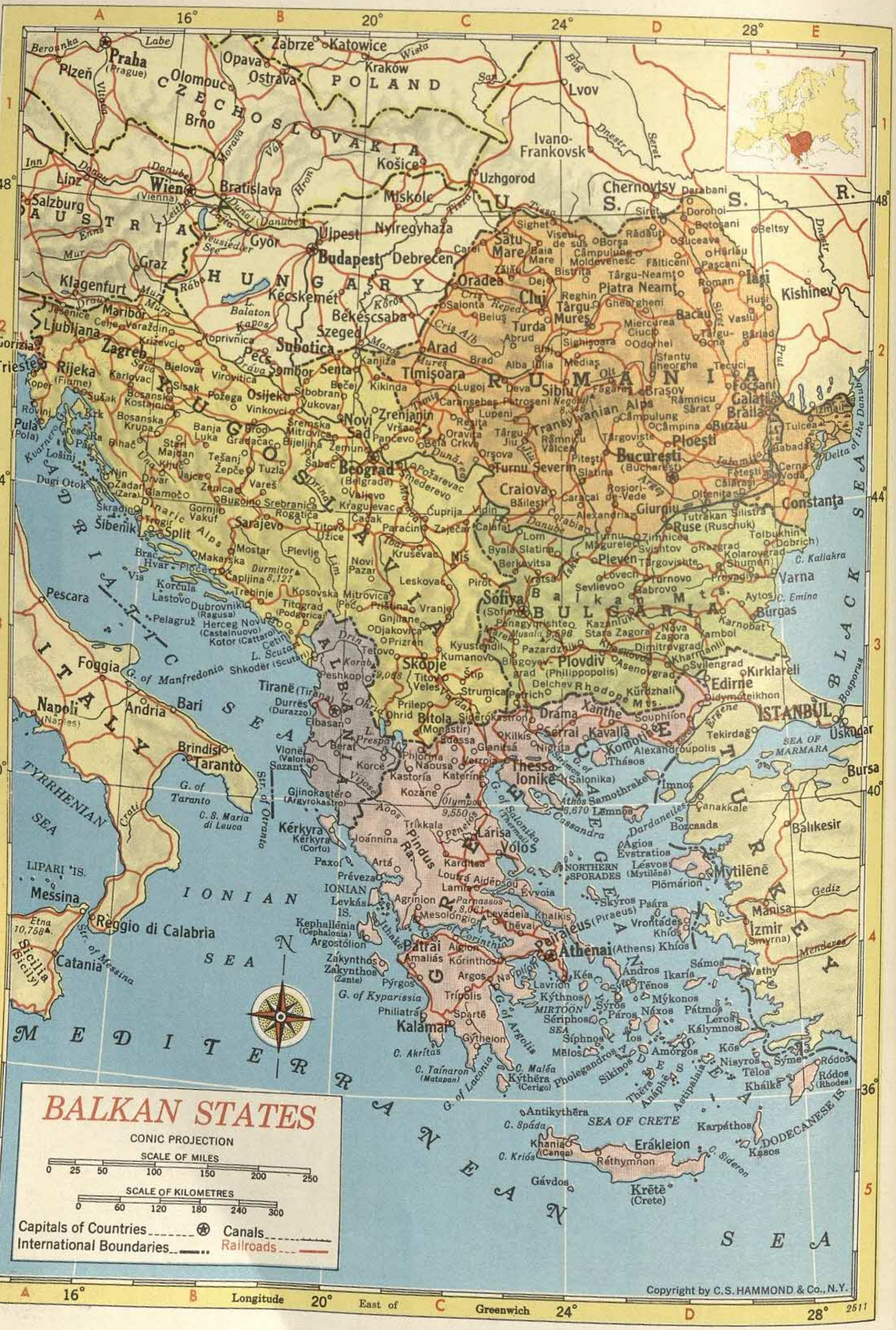
PROVINCE	CAPITAL
IONIO	Taranto
MASSA E CARRARA	Massa
PESARO E URBINO	Pesaro

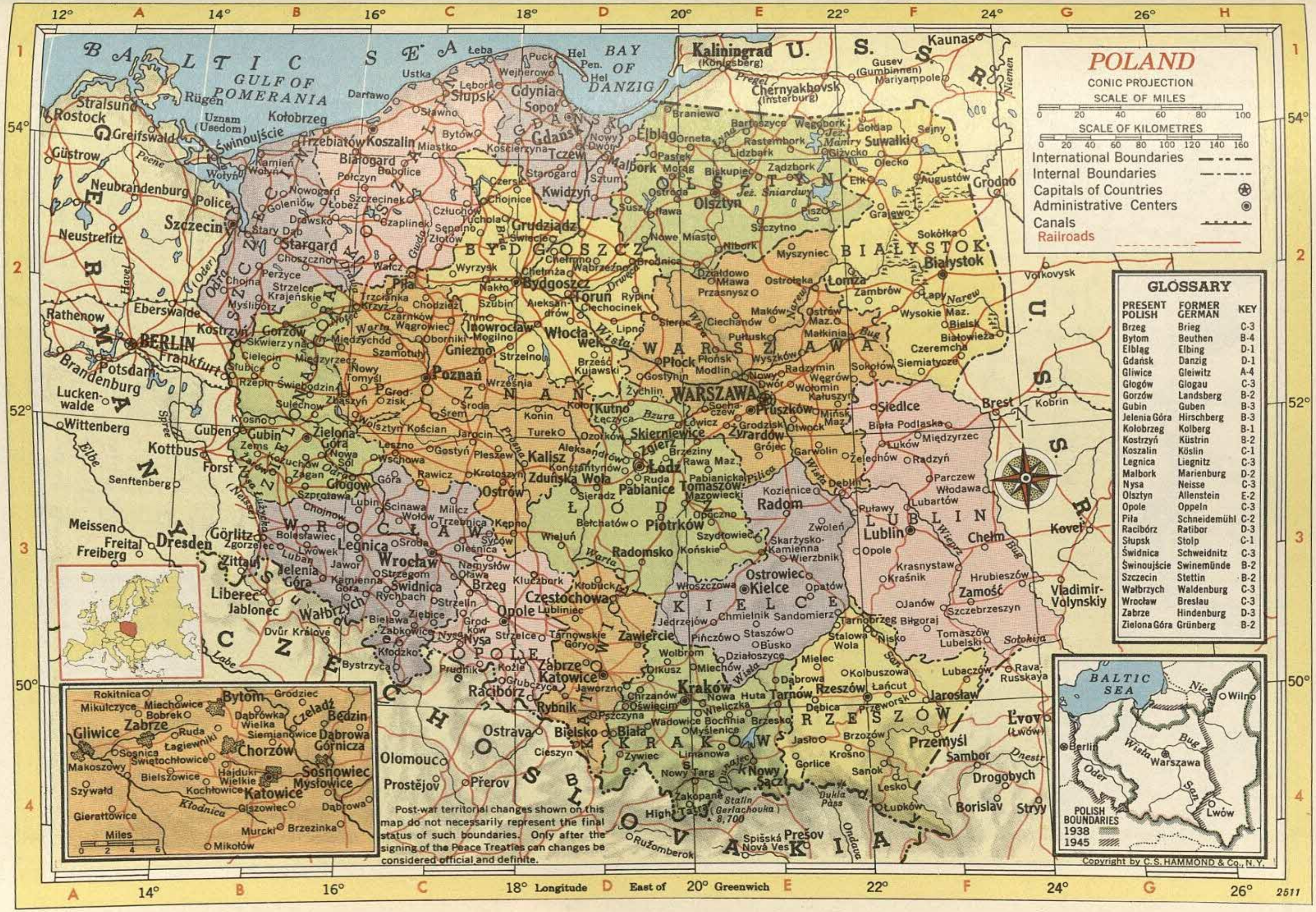


Copyright by C.S. HAMMOND & Co., N.Y.


SWITZERLAND AND LIECHTENSTEIN
CONIC PROJECTION
SCALE OF MILES
0 5 10 20 30
SCALE OF KILOMETRES
0 5 10 20 30 40 50
Capitals of Countries
Capitals of Cantons
International Boundaries
Cantonal Boundaries
Canals
Copyright by C. S. HAMMOND & Co., N.Y.
7684
GERMANY
AUSTRIA
LIECHTENSTEIN
ITALY
FRANCE
Longitude East of Greenwich


AUSTRIA
CZECHOSLOVAKIA
and HUNGARY
CONIC PROJECTION
SCALE OF MILES
0 20 40 60 80 100
SCALE OF KILOMETRES
0 20 40 60 80 100
Capitals of Countries
International Boundaries
Railroads
Canals
Same scale as main map
Longitude 16° East of Greenwich
Copyright by C. S. HAMMOND & Co., N.Y.

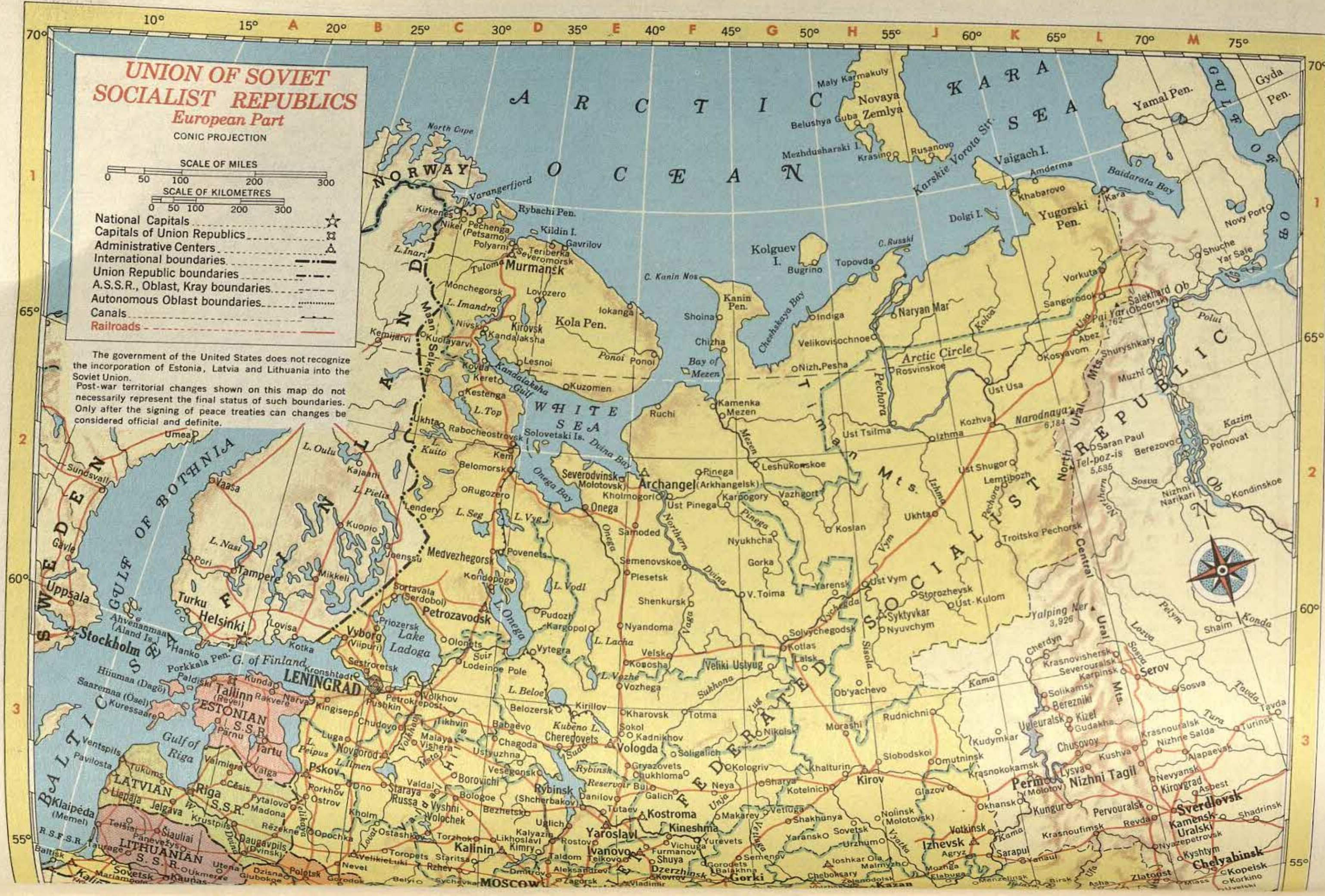

BALKAN STATES
CONIC PROJECTION
SCALE OF MILES
0 25 50 100 150 200 250
SCALE OF KILOMETRES
0 60 120 180 240 300
Capitals of Countries ⊛
International Boundaries
Canals
Railroads
Longitude East of Greenwich
16° 20° 24° 28°
48° 44° 40° 36°
A B C D E
1 2 3 4 5
CZECHOSLOVAKIA
POLAND
AUSTRIA
HUNGARY
YUGOSLAVIA
RUMANIA
BULGARIA
ALBANIA
GREECE
ITALY
TURKEY
U. S. S. R.
ADRIATIC SEA
TYRRHENIAN SEA
IONIAN SEA
MEDITERRANEAN SEA
AEGEAN SEA
BLACK SEA
SEA OF MARMARA
SEA OF CRETE
Praha (Prague)
Wien (Vienna)
Budapest
Beograd (Belgrade)
Bucureşti (Bucharest)
Sofiya (Sofia)
Tiranë (Tirana)
Athênai (Athens)
Kraków
Lvov
Bratislava
Zagreb
Ljubljana
Sarajevo
Skopje
Thessaloníke (Salonika)
Istanbul
Constanţa
Varna
Burgas
Plovdiv (Philippopolis)
Cluj
Timişoara
Iaşi
Kishinev
Chernovtsy
Napoli (Naples)
Bari
Taranto
Messina
Catania
Sicilia (Sicily)
Krêtê (Crete)
Erákleion
Izmir (Smyrna)
Bursa
Edirne
Pátrai
Kérkyra (Corfu)
DODECANESE IS.
Bosporus
Dardanelles
Transylvanian Alps
Balkan Mts.
Rhodope Mts.
Pindus Ra.
Dinaric Alps
Delta of the Danube
Copyright by C.S. HAMMOND & Co., N.Y.
2511



GLOSSARY

PRESENT POLISH	FORMER GERMAN	KEY
Brzeg	Brieg	C-3
Bytom	Beuthen	B-4
Elbląg	Elbing	D-1
Gdańsk	Danzig	D-1
Gliwice	Gleiwitz	A-4
Głogów	Glogau	C-3
Gorzów	Landsberg	B-2
Gubin	Guben	B-3
Jelenia Góra	Hirschberg	B-3
Kołobrzeg	Kolberg	B-1
Kostrzyń	Küstrin	B-2
Koszalin	Köslin	C-1
Legnica	Liegnitz	C-3
Malbork	Marienburg	D-2
Nysa	Neisse	C-3
Olsztyn	Allenstein	E-2
Opole	Oppeln	C-3
Piła	Schneidemühl	C-2
Racibórz	Ratibor	D-3
Słupsk	Stolp	C-1
Świdnica	Schweidnitz	C-3
Świnoujście	Swinemünde	B-2
Szczecin	Stettin	B-2
Wałbrzych	Waldenburg	C-3
Wrocław	Breslau	C-3
Zabrze	Hindenburg	D-3
Zielona Góra	Grünberg	B-2

Post-war territorial changes shown on this map do not necessarily represent the final status of such boundaries. Only after the signing of the Peace Treaties can changes be considered official and definite.



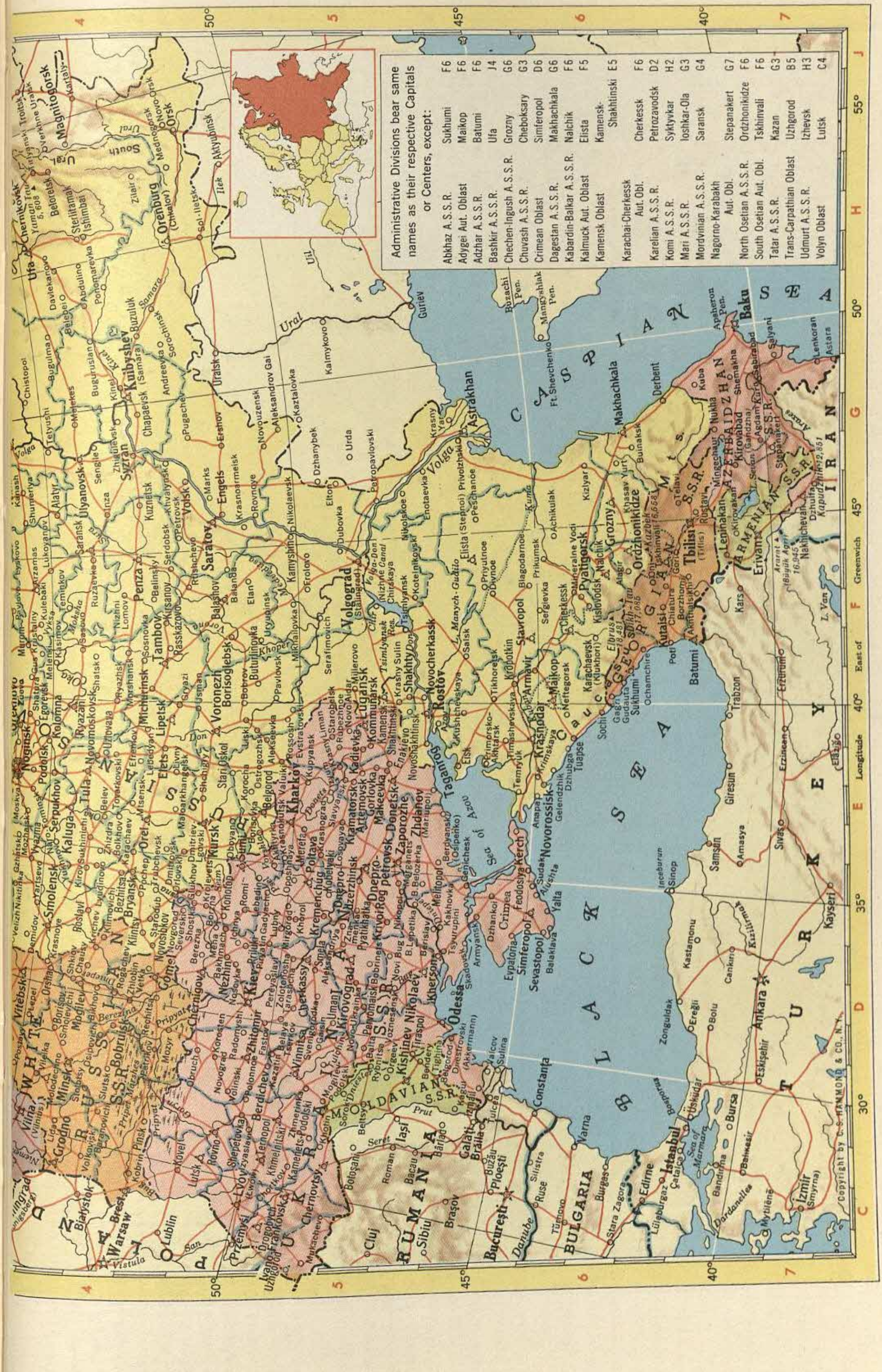
UNION OF SOVIET SOCIALIST REPUBLICS

European Part

CONIC PROJECTION

The government of the United States does not recognize the incorporation of Estonia, Latvia and Lithuania into the Soviet Union.

Post-war territorial changes shown on this map do not necessarily represent the final status of such boundaries. Only after the signing of peace treaties can changes be considered official and definite.



Administrative Divisions bear same names as their respective Capitals or Centers, except:

Abkhaz A.S.S.R.	Sukhumi	F6
Adygei Aut. Oblast	Maikop	F6
Adzhar A.S.S.R.	Batumi	F6
Bashkir A.S.S.R.	Ufa	J4
Chechen-Ingush A.S.S.R.	Grozny	G6
Chuvash A.S.S.R.	Cheboksary	G3
Crimean Oblast	Simferopol	D6
Dagestan A.S.S.R.	Makhachkala	G6
Kabardin-Balkar A.S.S.R.	Nalchik	F6
Kalmuck Aut. Oblast	Elista	F5
Kamensk Oblast	Kamensk-Shakhtinski	E5
Karachai-Cherkessk Aut. Obl.	Cherkessk	F6
Karelian A.S.S.R.	Petrozavodsk	D2
Komi A.S.S.R.	Syktyvkar	H2
Mari A.S.S.R.	Ioshkar-Ola	G3
Mordvinian A.S.S.R.	Saransk	G4
Nagorno-Karabakh Aut. Obl.	Stepanakert	G7
North Osetian A.S.S.R.	Ordzhonikidze	F6
South Osetian Aut. Obl.	Tskhinvali	F6
Tatar A.S.S.R.	Kazan	G3
Trans-Carpathian Oblast	Uzhgorod	B5
Udmurt A.S.S.R.	Izhevsk	H3
Volyn Oblast	Lutsk	C4

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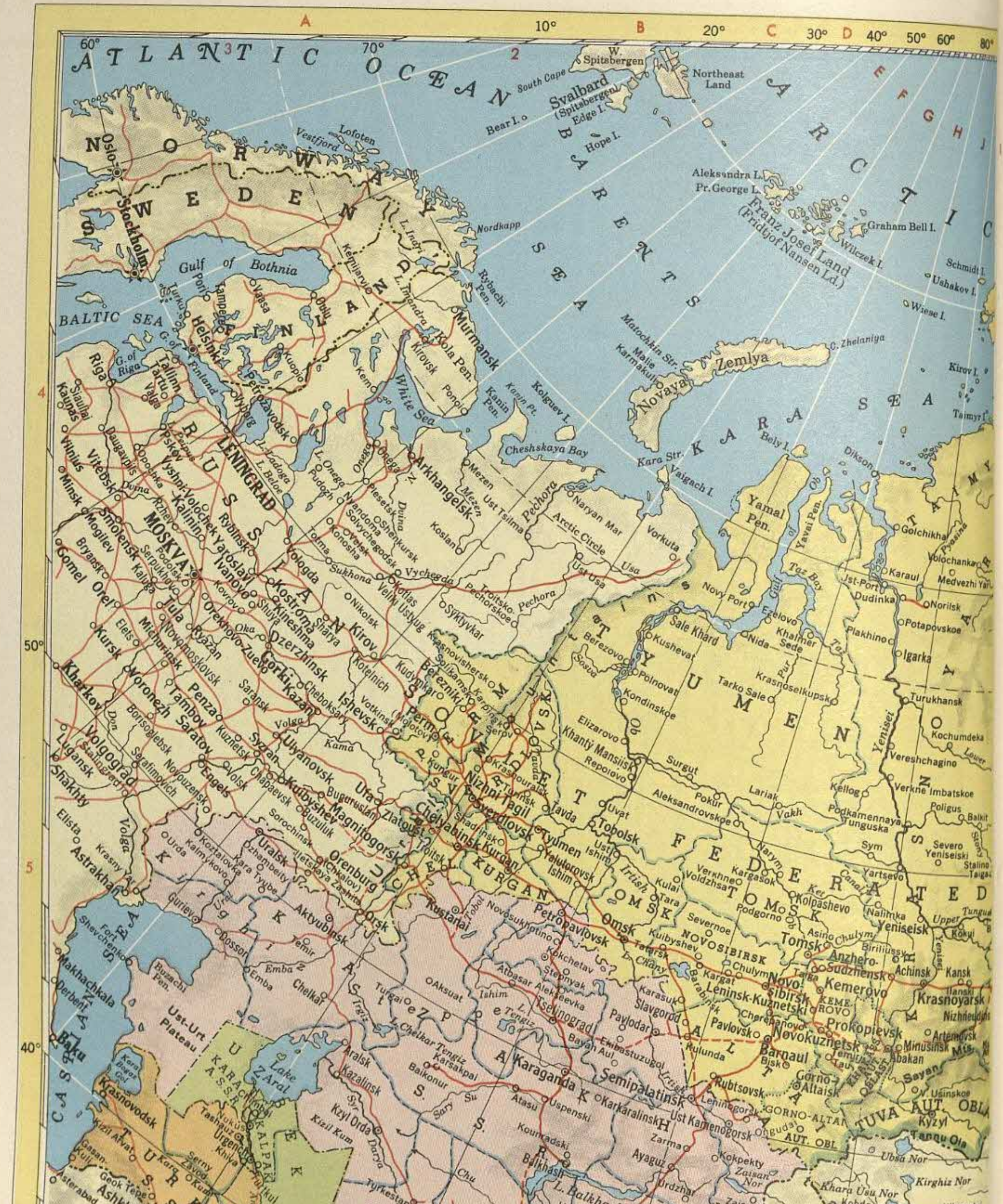
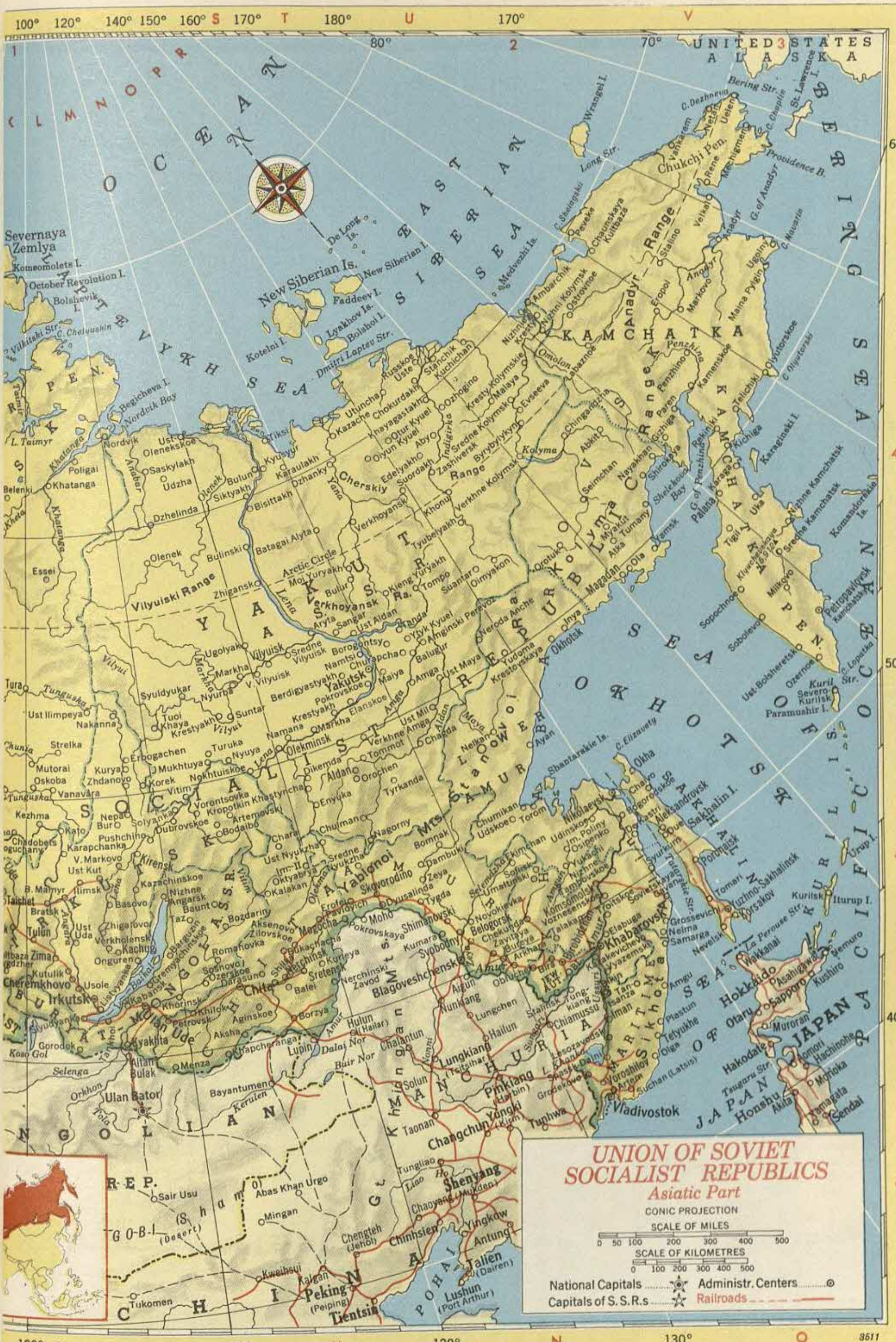


The administrative divisions of the Kazakh, Tadzhik, Uzbek and Kirghiz S. S. R.'s bear the same names as their centers, except: North Kazakhstan— *Petropavlovsk*, South Kazakhstan— *Chimkent*, East Kazakhstan— *Ust-Kamenogorsk*, West Kazakhstan— *Uralsk*, Kashka-Darya— *Karshi*, Sukhan-Darya— *Termez*, Khorezm— *Urgench*, Issyk Kul— *Przhevalsk*, Garm-*Novabad* and Tien Shan-*Naryn*.

Postwar territorial changes shown on this map do not necessarily represent the final status of such boundaries. Only after the signing of the Peace Treaties can changes be considered official and definite.



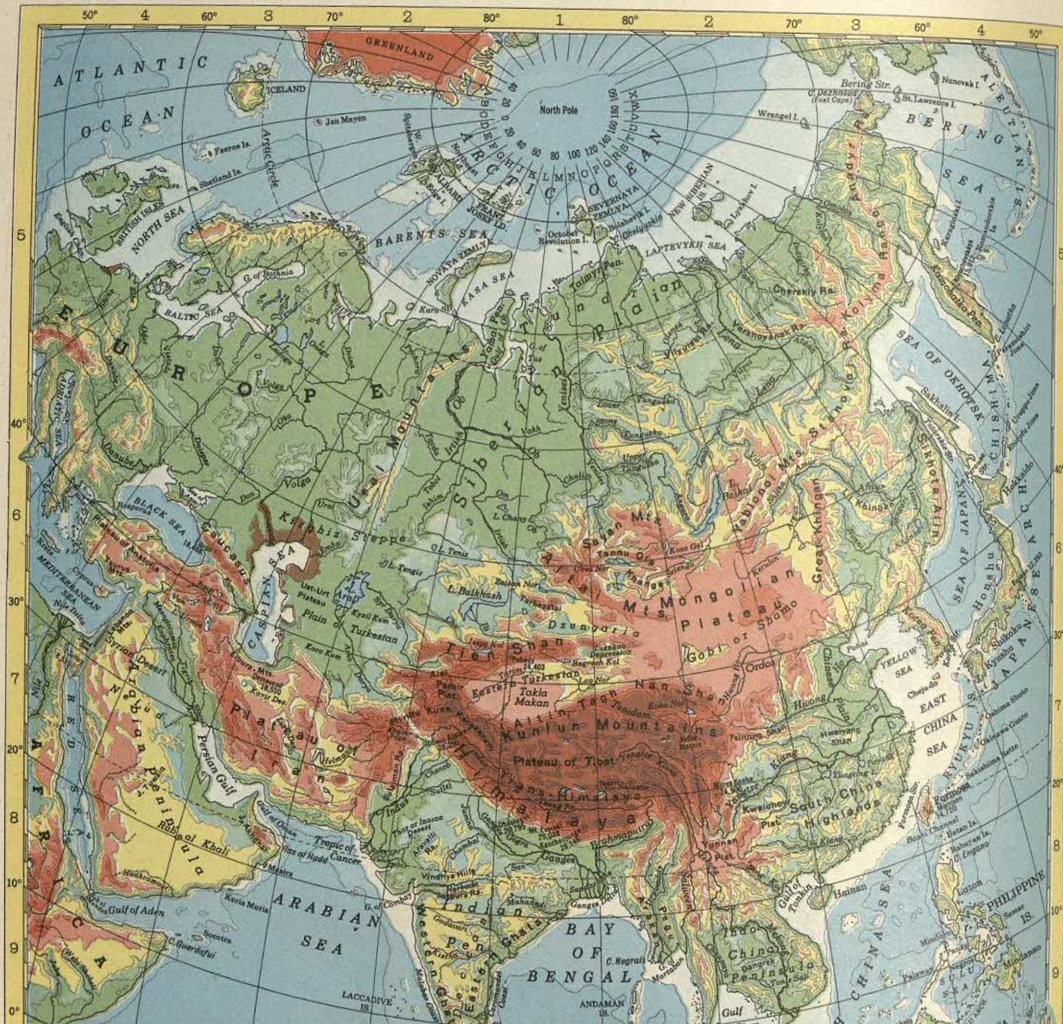
UNION OF SOVIET SOCIALIST REPUBLICS
Asiatic Part

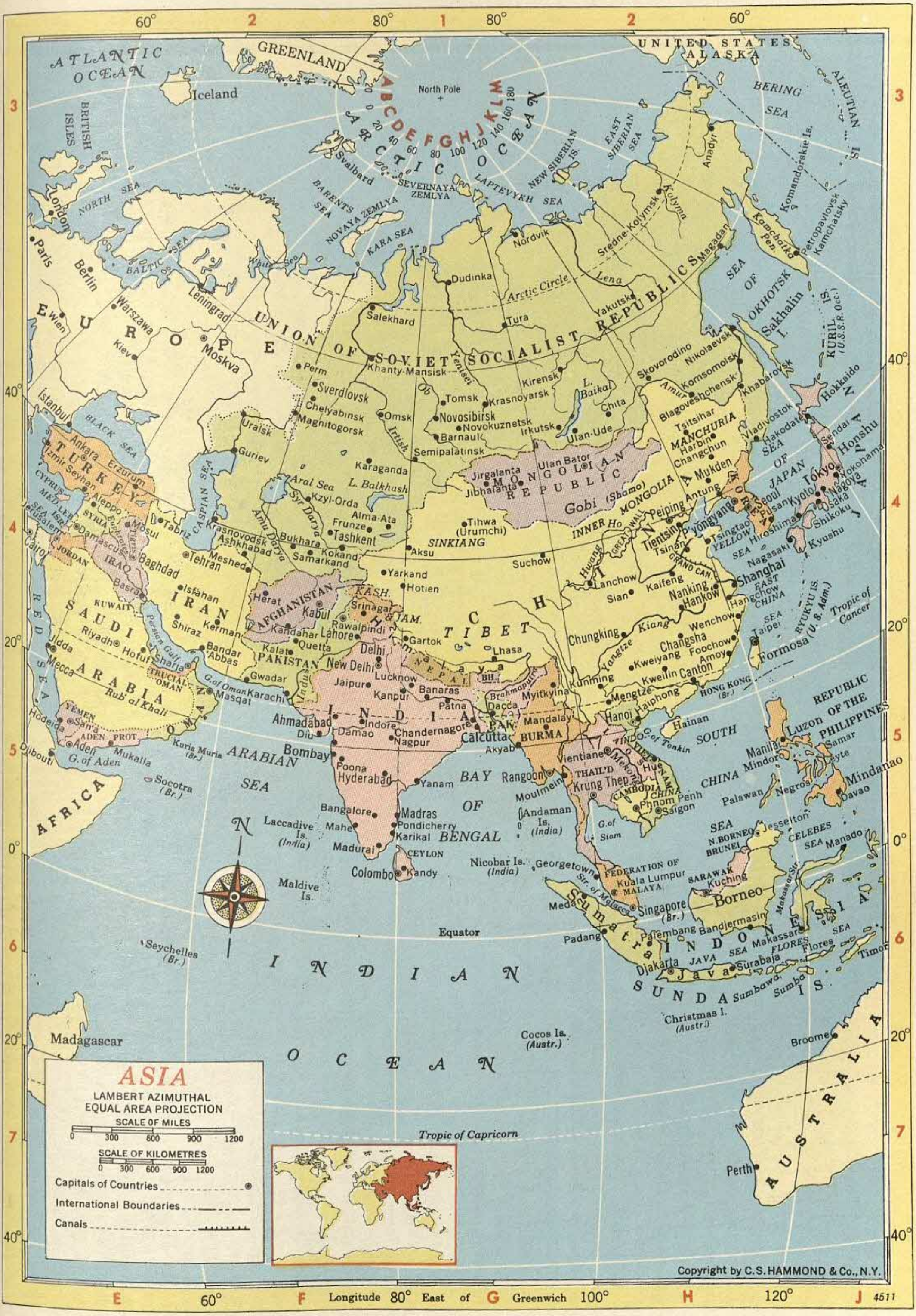
CONIC PROJECTION

SCALE OF MILES

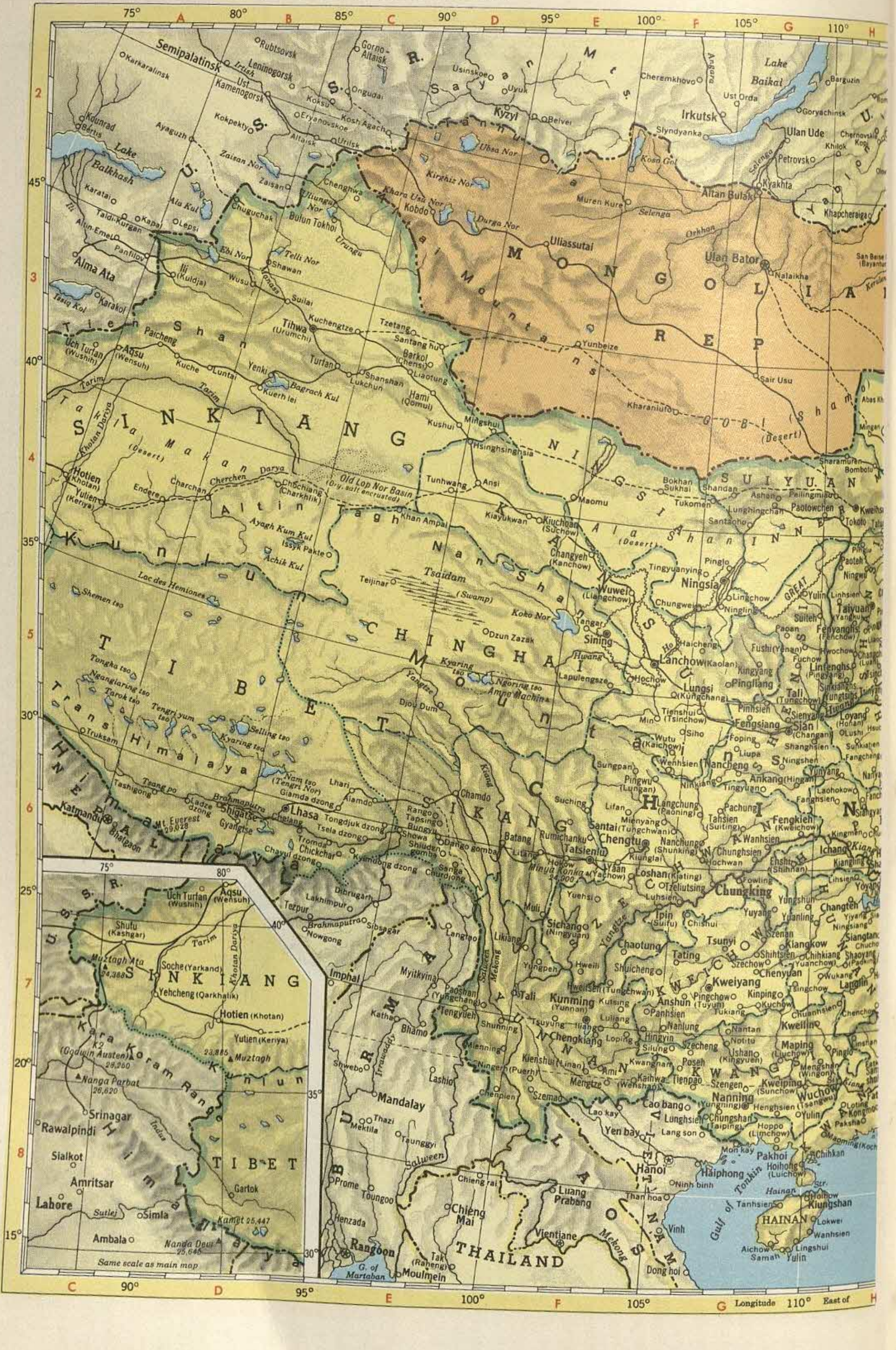
SCALE OF KILOMETRES

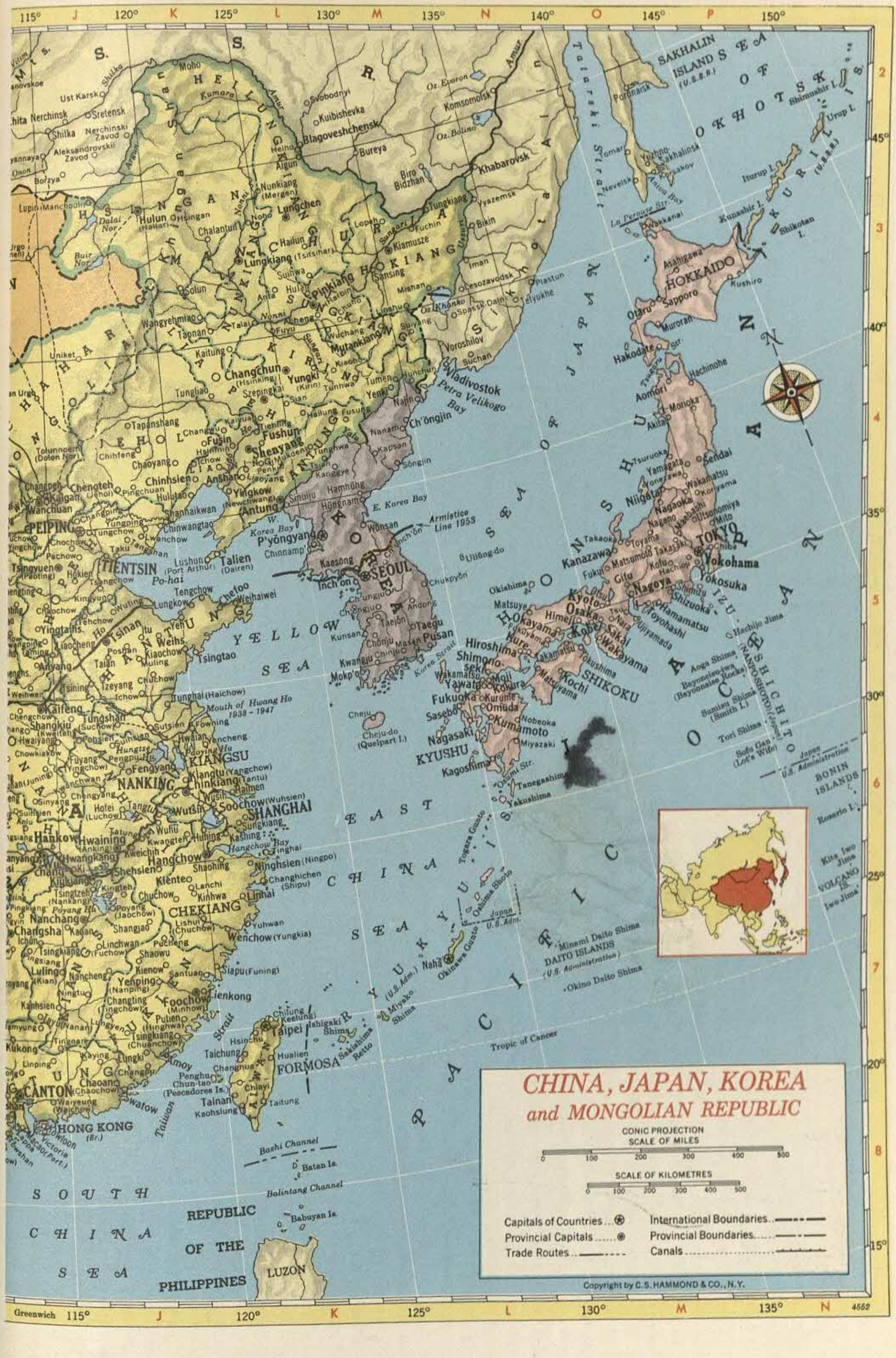
National Capitals
Capitals of S.S.R.s
Administr. Centers
Railroads

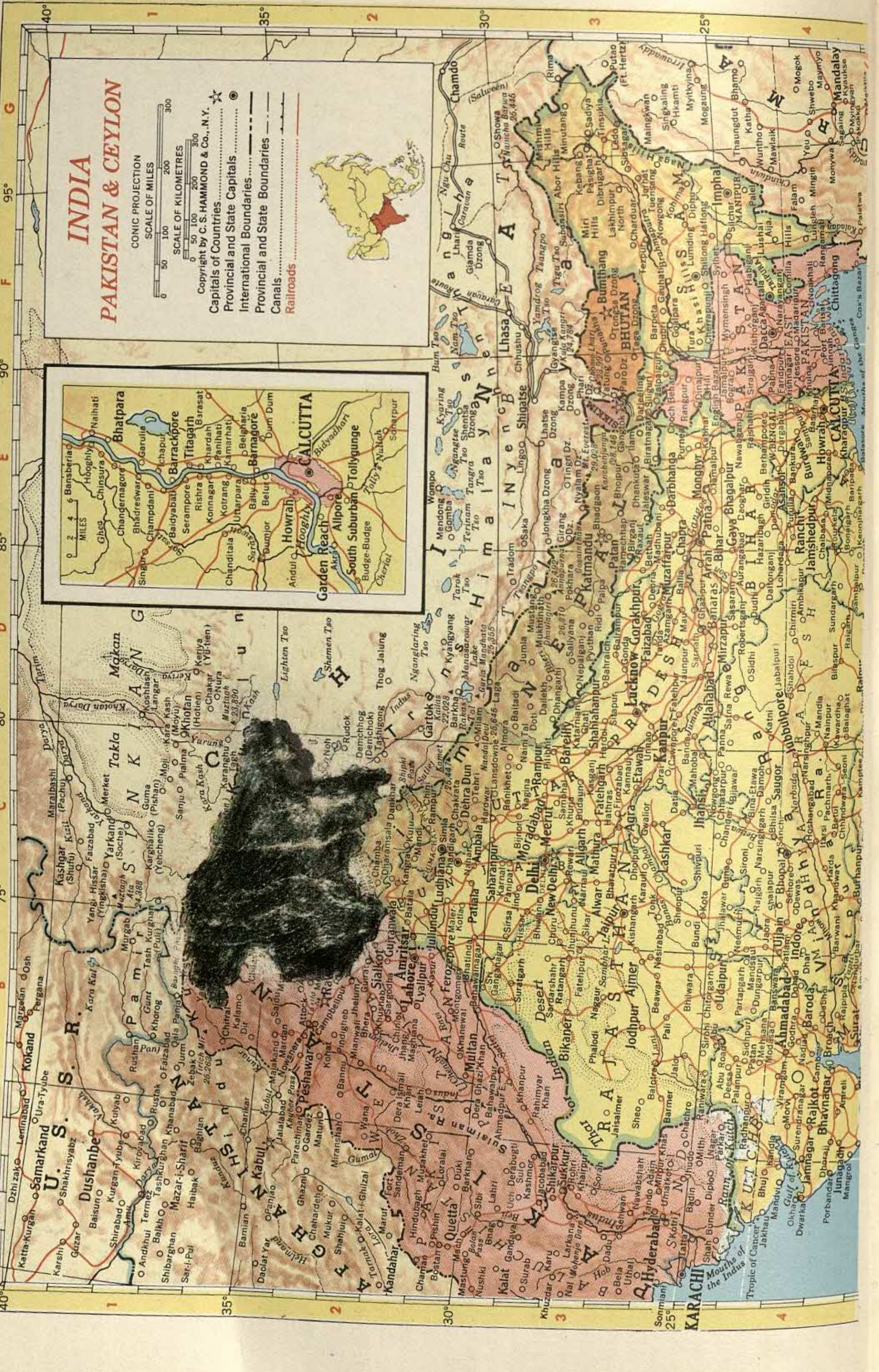

ASIA
PHYSICAL
Copyright by C. S. HAMMOND & CO., N. Y.
SCALE OF MILES
0 150 300 600 900 1200
SCALE OF KILOMETRES
0 300 600 900 1200
Mountain Altitudes in Feet
Metres
Feet
5000
16400
4000
13120
3000
9840
2000
6560
1000
3280
500
1640
200
656
Sea
Level
Depression
Depression
200
109
3000
1640
Metres
Fathoms
ATLANTIC OCEAN
ARCTIC OCEAN
North Pole
GREENLAND
ICELAND
Jan Mayen
Faeroe Is.
Shetland Is.
BRITISH ISLES
NORTH SEA
Arctic Circle
Spitsbergen
FRANZ JOSEF LD.
NOVAYA ZEMLYA
BARENTS SEA
KARA SEA
SEVERNAYA ZEMLYA
October Revolution I.
Bolshevik I.
NEW SIBERIAN IS.
Lyakhov I.
LAPTEVYKH SEA
Taimyr Pen.
Wrangel I.
Bering Str.
C. Dezhnev (East Cape)
St. Lawrence I.
Nunevak I.
BERING SEA
ALEUTIAN IS.
Kamchatka Pen.
SEA OF OKHOTSK
Sakhalin I.
KURIL IS.
Hokkaido
SEA OF JAPAN
Honshu
Shikoku
Kyushu
JAPANESE ARCH.
Cherskiy Ra.
Verkhoyansk Ra.
Kolyma Ra.
Stanovoi Ra.
Yablonoi Mts.
Sikhota Alin
Great Khingan
L. Baikal
Amur
Lena
Vilyui
Aldan
Yenisei
Lower Tunguska
Stony Tunguska
Upper Tunguska
Tundra
Siberian Plain
Ural Mountains
Ob
Irtish
Ishim
Tobol
Yamal Pen.
G. of Ob
G. of Taz
Kara Str.
EUROPEAN PLAIN
G. of Bothnia
BALTIC SEA
Dvina
Pechora
Volga
Oka
Don
Dnieper
Danube
BLACK SEA
Bosporus
Caucasus
CASPIAN SEA
ARAL SEA
Ust-Urt Plateau
Kirghiz Steppe
Emba
Ural
Plain of Turkestan
Kyzil Kum
Kara Kum
Syr Darya
Amu Darya
L. Balkhash
L. Tengiz
Zaisan Nor
Dzungaria
Altai Mts.
Sayan Mts.
Tannu Ola
Khangai
Kosogol
Mongolian Plateau
Gobi or Shamo
Ordos
Tien Shan
Pamir Plat.
Eastern Turkestan
Takla Makan
Lop Nor
Altin Tagh
Nan Shan
Kunlun Mountains
Plateau of Tibet
Trans-Himalaya
Himalaya
Hindu Kush
Karakoram
Mt. Everest 29,141
Brahmaputra
Ganges
Ganges Delta
Indus
Sutlej
Thar or Indian Desert
Aravalli Mts.
Vindhya Hills
Satpura Ra.
Mahanadi
Godavari
Kistna
Indian Peninsula
Western Ghats
Eastern Ghats
Malabar Coast
Coromandel Coast
G. of Cambay
G. of Manar
C. Comorin
Ceylon
Dondra Head
LACCADIVE IS.
MALDIVE IS.
ARABIAN SEA
BAY OF BENGAL
C. Negrais
ANDAMAN IS.
NICOBAR IS.
G. of Martaban
Irrawaddy
Salween
Mekong
Indo-China Peninsula
Gulf of Siam
Pte. de Camau
Malay Peninsula
Str. of Malacca
G. of Tonkin
Hainan
Yunnan Plat.
Kweichow Plat.
South China Highlands
Si Kiang
Yangtze Kiang
Hwang Ho
Tsinling Shan
Chinese Plain
Poyang
Tungting L.
YELLOW SEA
EAST CHINA SEA
Cheju-do
Korea Pen.
RYUKYU IS.
Formosa
Pescadores
Bashi Channel
Batan Is.
Babuyan Is.
C. Engano
Luzon
PHILIPPINE IS.
Samar
Mindoro
Panay
Negros
Mindanao
Palawan
SULU SEA
SULU ARCH.
CELEBES SEA
Celebes
Moluccas
BANDA SEA
FLORES SEA
Flores
Timor
SOUTH CHINA SEA
Natoena
C. Romania
Borneo
Kinabalu 13,451
Schwaner Mts.
Karimata Str.
Bangka
Billiton
JAVA SEA
Java
Soenda Str.
Sumatra
Barisan Mts.
Mt. Loser 11,093
Simeuloee
Nias
Siberoet
SOENDA ISLANDS
Christmas I.
Cocos Is.
AUSTRALIA
Equator
INDIAN OCEAN
Chagos Arch.
Diego Garcia
SEYCHELLES
COMORES
MADAGASCAR
St. Brandon Group
Mauritius
Reunion
Rodrigues I.
Tropic of Capricorn
Tropic of Cancer
Socotra
Kuria Muria
Masira
C. Guardafui
Gulf of Aden
Ras al Hadd
Gulf of Oman
Persian Gulf
Rub al Khali
Hadhramaut
Arabian Peninsula
Syrian Desert
Nefud
RED SEA
Nile
Nile Delta
MEDITERRANEAN SEA
Cyprus
Crete
Lebanon Mts.
Taurus Mts.
Plateau of Anatolia
Zagros Mts.
Elburz Mts.
Demavend 18,550
Kavir Des.
Plateau of Iran
Helmand
Suleiman Ra.
Tigris
Euphrates
Mesopotamia
AFRICA
EUROPE
ADRIATIC SEA
Longitude 80° East of Greenwich 90°
50° 4 60° 3 70° 2 80° 1 80° 2 70° 3 60° 4 50°
H 50° J 60° K 70° L 80° M 90° N 100° O 110° P 120° Q
5 6 7 8 9 10 11 12
40° 30° 20° 10° 0° 10° 20° 30°

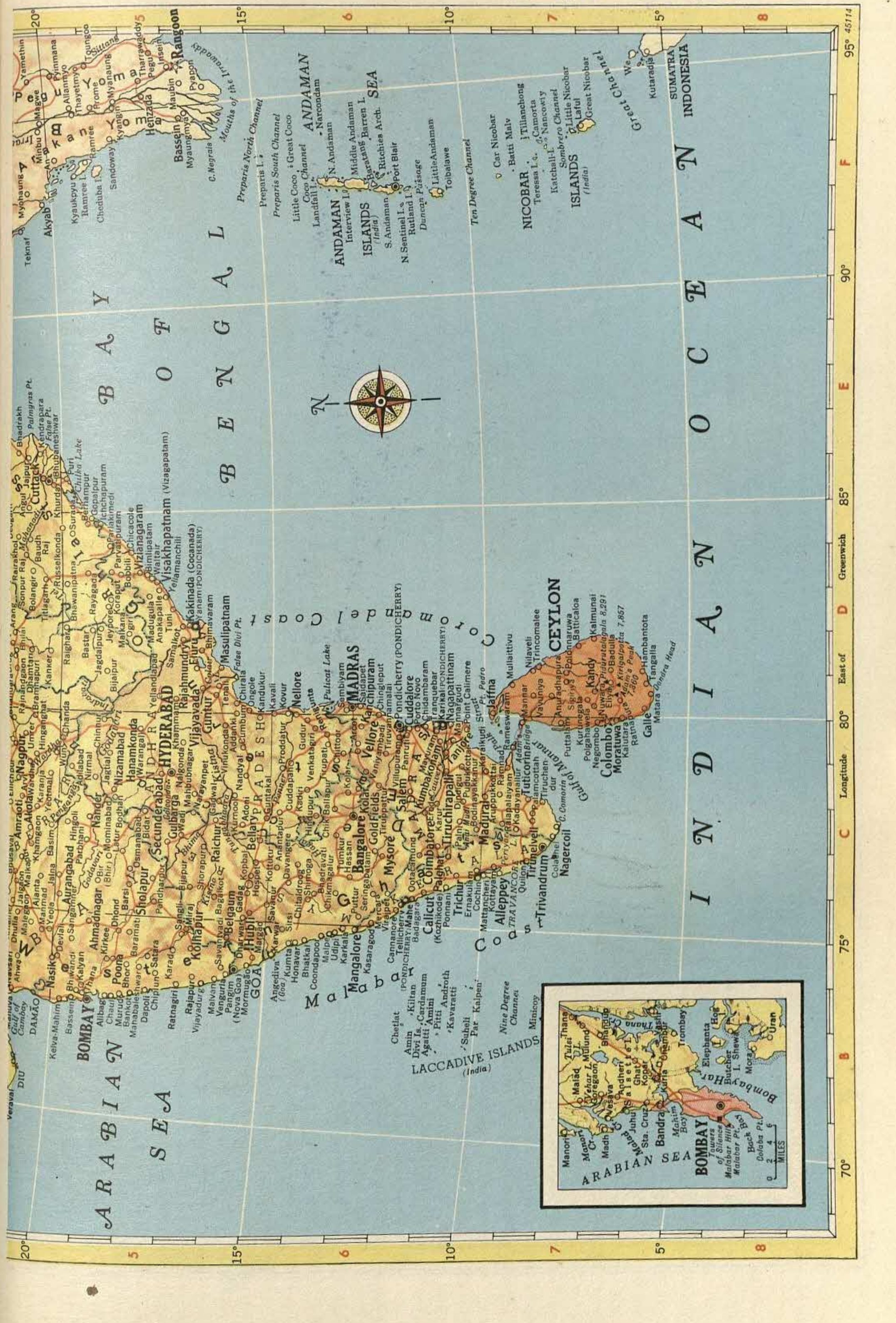

ASIA
LAMBERT AZIMUTHAL
EQUAL AREA PROJECTION
SCALE OF MILES
0 300 600 900 1200
SCALE OF KILOMETRES
0 300 600 900 1200
Capitals of Countries
International Boundaries
Canals
Copyright by C.S. HAMMOND & Co., N.Y.
Longitude 80° East of Greenwich 100°
60°
120°
E
F
G
H
J
4511
1
2
3
4
5
6
7
North Pole
ARCTIC OCEAN
ATLANTIC OCEAN
GREENLAND
Iceland
BRITISH ISLES
NORTH SEA
BALTIC SEA
London
Paris
Berlin
Wien
Warszawa
Leningrad
Kiev
Moskva
EUROPE
Svalbard
BARENTS SEA
NOVAYA ZEMLYA
KARA SEA
SEVERNAYA ZEMLYA
LAPTEVYKH SEA
NEW SIBERIAN IS.
EAST SIBERIAN SEA
UNITED STATES
ALASKA
BERING SEA
ALEUTIAN IS.
Komandorskie Is.
Anadyr
Kolyma
Sredne-Kolymsk
Magadan
Kamchatka Pen.
Petropavlovsk Kamchatsky
SEA OF OKHOTSK
Sakhalin I.
KURIL IS. (U.S.S.R. Occ.)
UNION OF SOVIET SOCIALIST REPUBLICS
Nordvik
Dudinka
Arctic Circle
Lena
Yakutsk
Tura
Salekhard
Perm
Khanty-Mansisk
Yenisei
Ob
Sverdlovsk
Chelyabinsk
Magnitogorsk
Omsk
Irtish
Tomsk
Novosibirsk
Novokuznetsk
Barnaul
Krasnoyarsk
Kirensk
L. Baikal
Irkutsk
Chita
Ulan-Ude
Skovorodino
Nikolaevsk
Komsomolsk
Amur
Blagoveshchensk
Khabarovsk
Uralsk
Guriev
Semipalatinsk
Karaganda
L. Balkhash
Aral Sea
Kzyl-Orda
Syr Darya
Alma-Ata
Frunze
Tashkent
Amu Darya
Krasnovodsk
Ashkhabad
Bukhara
Samarkand
Kokand
CASPIAN SEA
BLACK SEA
Istanbul
Ankara
Erzurum
Izmir
Seyhan
TURKEY
CYPRUS
MED. SEA
LEB.
ISR.
SYRIA
Aleppo
Damascus
Jerusalem
JORDAN
Cairo
Mosul
Tabriz
Euphrates
Tigris
Baghdad
IRAQ
Basra
KUWAIT
Tehran
Meshed
Isfahan
IRAN
Shiraz
Kerman
Bandar Abbas
Persian Gulf
Sharja
TRUCIAL OMAN
G. of Oman
Masqat
OMAN
SAUDI ARABIA
Riyadh
Hofuf
Jidda
Mecca
Rub' al Khali
RED SEA
YEMEN
Sana
Hodeida
ADEN PROT.
Aden
Mukalla
G. of Aden
Djibouti
Kuria Muria (Br.)
Socotra (Br.)
AFRICA
ARABIAN SEA
Herat
AFGHANISTAN
Kabul
Kandahar
KASH.
Srinagar
& JAM.
Rawalpindi
Lahore
Quetta
Kalat
PAKISTAN
Gwadar
Karachi
Indus
Delhi
New Delhi
Lucknow
Kanpur
Banaras
Jaipur
Patna
Ahmadabad
Diu
Damao
Indore
Chandernagore
Nagpur
Calcutta
Bombay
Poona
Hyderabad
Yanam
INDIA
NEPAL
BH.
Bangalore
Madras
Mahe
Pondicherry
Karikal
Madurai
Laccadive Is. (India)
Maldive Is.
CEYLON
Colombo
Kandy
Gartok
TIBET
Lhasa
Brahmaputra
Dacca
PAK.
Yarkand
Hotien
Aksu
SINKIANG
Tihwa (Urumchi)
Jirgalanta
Jibhalanta
Ulan Bator
MONGOLIAN REPUBLIC
Gobi (Shamo)
INNER MONGOLIA
Suchow
GREAT WALL
Hwang Ho
CHINA
Lanchow
Sian
Kaifeng
Peiping
Tientsin
Tsinan
Antung
Mukden
MANCHURIA
Tsitsihar
Harbin
Changchun
KOREA
P'yongyang
Seoul
Pusan
GRAND CANAL
Nanking
Hankow
Shanghai
Hangchow
Tsingtao
YELLOW SEA
EAST CHINA SEA
Chungking
Yangtze
Kiang
Changsha
Kweiyang
Foochow
Wenchow
Amoy
Kweilin
Canton
Kunming
Mengtze
HONG KONG (Br.)
Taipei
Formosa
Vladivostok
SEA OF JAPAN
Hakodate
Hokkaido
Sendai
Honshu
Tokyo
Yokohama
Nagoya
Kyoto
Osaka
Hiroshima
Shikoku
Nagasaki
Kyushu
JAPAN
RYUKYU IS. (U.S. Adm.)
Tropic of Cancer
Myitkyina
Mandalay
BURMA
Akyab
Rangoon
Moulmein
BAY OF BENGAL
Andaman Is. (India)
Nicobar Is. (India)
Hanoi
Haiphong
G. of Tonkin
Hainan
LAOS
Vientiane
THAIL'D
Krung Thep
Mekong
VIETNAM
Hue
CAMBODIA
INDO-CHINA
Phnom Penh
Saigon
G. of Siam
SOUTH CHINA SEA
Georgetown
FEDERATION OF MALAYA
Kuala Lumpur
Str. of Malacca
Singapore (Br.)
Medan
Sumatra
Padang
Palembang
Djakarta
JAVA SEA
Java
Surabaja
Bandjermasin
Makassar
Makassar Str.
FLORES SEA
Flores
Sumbawa
Sumba
Timor
SUNDA IS.
INDONESIA
N. BORNEO
BRUNEI
Jesselton
SARAWAK
Kuching
Borneo
CELEBES SEA
Manado
REPUBLIC OF THE PHILIPPINES
Luzon
Manila
Mindoro
Samar
Leyte
Negros
Palawan
Mindanao
Davao
Equator
Seychelles (Br.)
INDIAN OCEAN
Madagascar
Christmas I. (Austr.)
Cocos Is. (Austr.)
Tropic of Capricorn
Broome
Perth
AUSTRALIA

50 — CHINA, JAPAN, KOREA, MONGOLIA

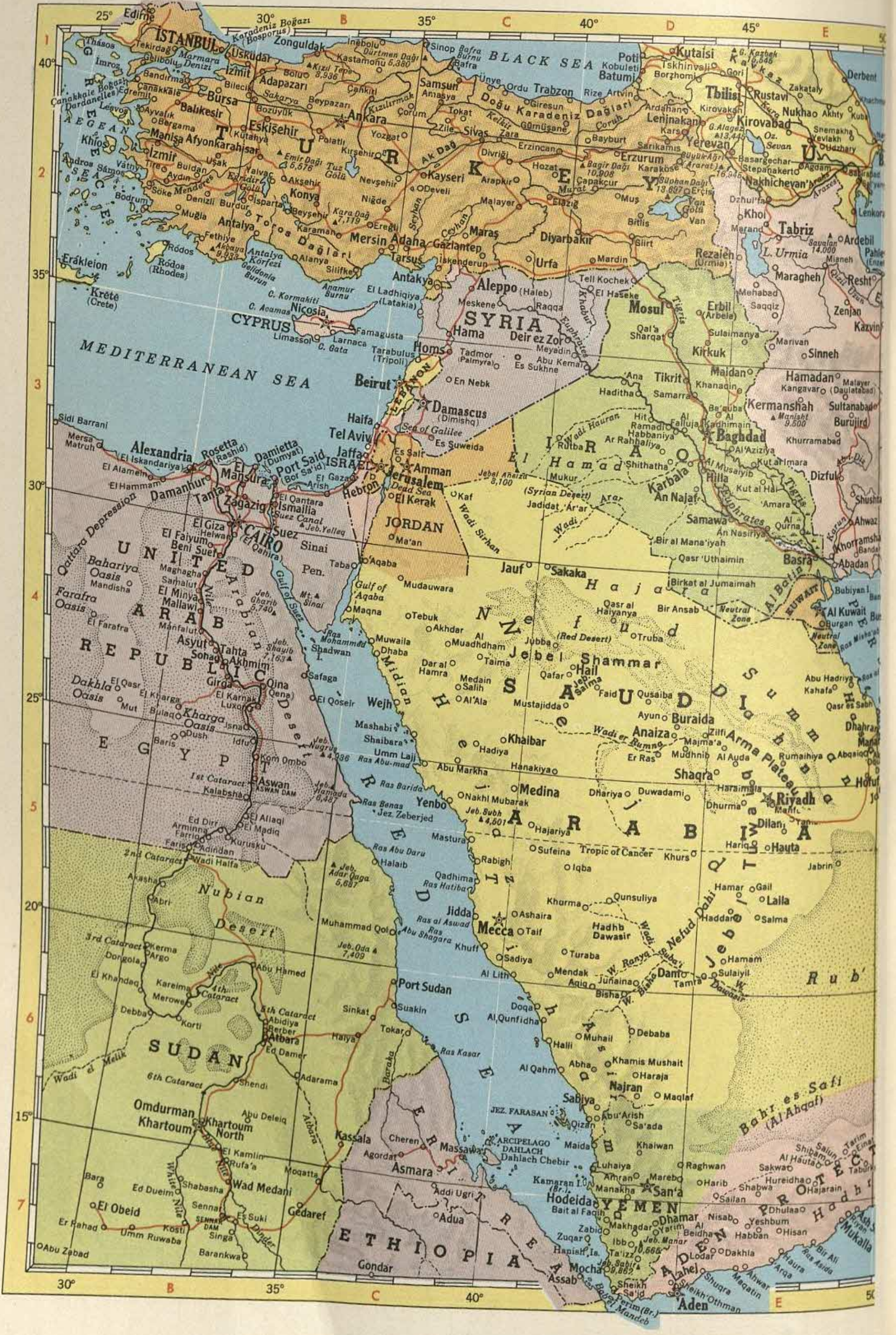



CHINA, JAPAN, KOREA
and MONGOLIAN REPUBLIC
CONIC PROJECTION
SCALE OF MILES
0 100 200 300 400 500
SCALE OF KILOMETRES
0 100 200 300 400 500
Capitals of Countries
Provincial Capitals
Trade Routes
International Boundaries
Provincial Boundaries
Canals
Copyright by C. S. HAMMOND & CO., N.Y.
4552
Greenwich 115° 120° 125° 130° 135°
HOKKAIDO
KYUSHU
SHIKOKU
FORMOSA
LUZON
REPUBLIC OF THE PHILIPPINES
SEA OF JAPAN
YELLOW SEA
EAST CHINA SEA
SOUTH CHINA SEA
SEA OF OKHOTSK
PACIFIC OCEAN
KOREA
SEOUL
P'yŏngyang
TOKYO
PEIPING
NANKING
SHANGHAI
CANTON
HONG KONG
Vladivostok
Armistice Line 1953
Tropic of Cancer
BONIN ISLANDS
VOLCANO IS.
DAITO ISLANDS
RYUKYU IS.
SAKHALIN ISLAND (U.S.S.R.)
KURIL IS. (U.S.S.R.)

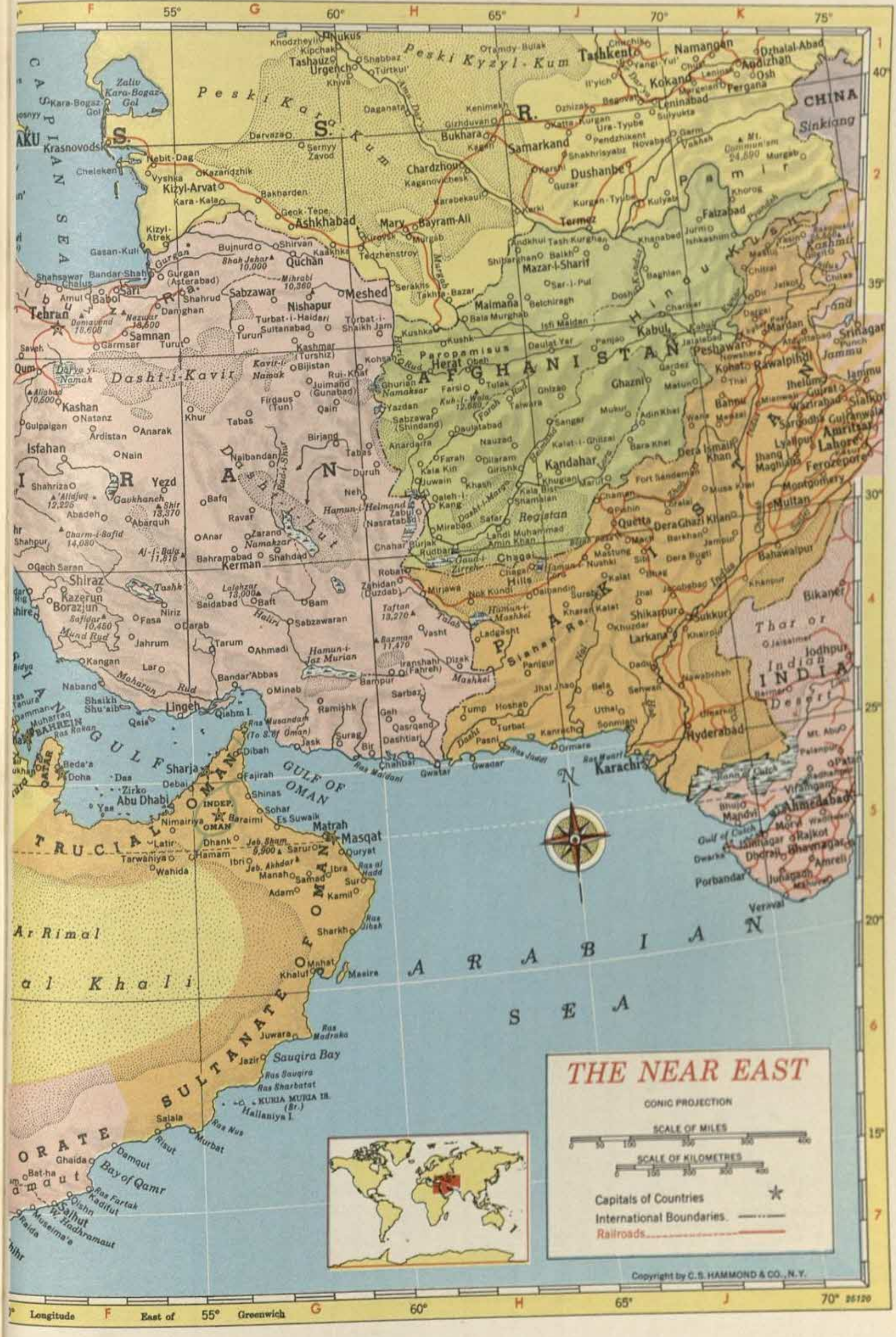

INDIA
PAKISTAN & CEYLON
CONIC PROJECTION
SCALE OF MILES
0 50 100 200 300
SCALE OF KILOMETRES
0 50 100 200 300
Copyright by C. S. HAMMOND & Co., N.Y.
Capitals of Countries
Provincial and State Capitals
International Boundaries
Provincial and State Boundaries
Canals
Railroads
CALCUTTA
Howrah
Garden Reach
South Suburban
Tollygunge
Barrackpore
Bhatpara
Titagarh
Barnagore
MILES
0 2 4 6
New Delhi
Delhi
Karachi
Lahore
Kabul
Lhasa
Katmandu
Hyderabad
Ahmadabad
Lucknow
Kanpur
Patna
Dacca
Chittagong
Mandalay
Kandahar
Quetta
Peshawar
Multan
Rawalpindi
Samarkand
Dushanbe
Kashgar
Yarkand
Khotan
BHUTAN
NEPAL
SIKKIM
EAST PAKISTAN
WEST PAKISTAN
AFGHANISTAN
RAJASTHAN
UTTAR PRADESH
BIHAR
WEST BENGAL
ASSAM
MADHYA PRADESH
PUNJAB
U.S.S.R.
Himalaya
Takla Makan
Thar or Indian Desert
Tropic of Cancer
Mouths of the Indus
Rann of Kutch
Gulf of Kutch
1 2 3 4
A B C D E F G
65° 70° 75° 80° 85° 90° 95°
40° 35° 30° 25°

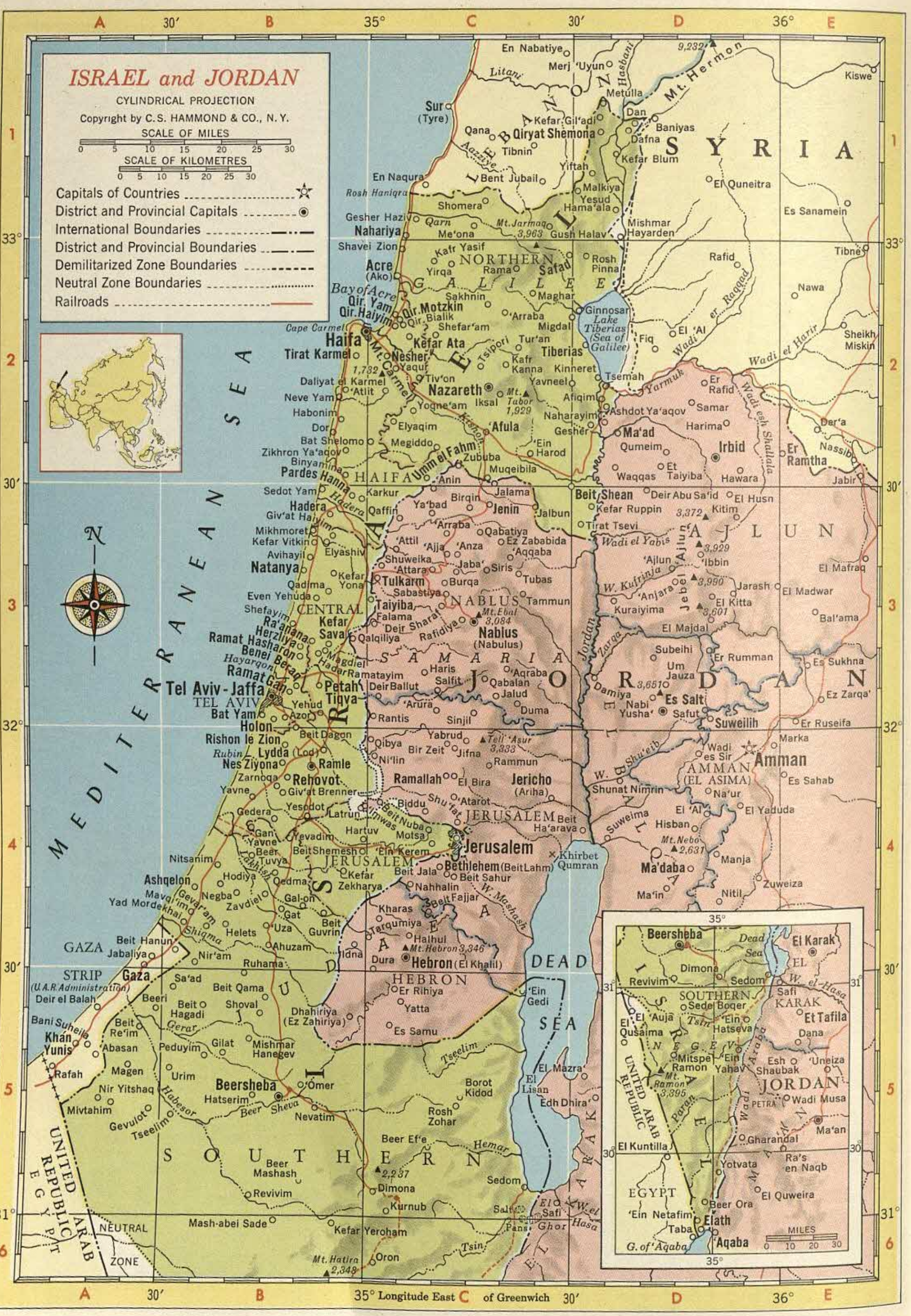

ARABIAN SEA
BAY OF BENGAL
ANDAMAN SEA
INDIAN OCEAN
ANDAMAN ISLANDS (India)
NICOBAR ISLANDS (India)
LACCADIVE ISLANDS (India)
CEYLON
Malabar Coast
Coromandel Coast
ANDHRA
MADRAS
BOMBAY
HYDERABAD
Secunderabad
Nagpur
Poona
Bangalore
Mysore
Madurai
Trivandrum
Colombo
Kandy
Jaffna
Trincomalee
Galle
Rangoon
Bassein
Akyab
Port Blair
Cuttack
Visakhapatnam (Vizagapatam)
Masulipatnam
Pondicherry (PONDICHERRY)
Calicut
Mangalore
GOA
Kolhapur
Sholapur
Aurangabad
Gulf of Mannar
C. Comorin
Ten Degree Channel
Nine Degree Channel
Great Channel
Preparis North Channel
Preparis South Channel
Coco Channel
Duncan Passage
Palk Strait
Mouths of the Irrawaddy
SUMATRA
INDONESIA
Adam's Peak 7,360
Pidurutalagala 8,291
20°
15°
10°
5°
70°
75°
80°
85°
90°
95°
Longitude East of Greenwich
B
C
D
E
F
5
6
7
8
45114
ARABIAN SEA
BOMBAY
Bombay Har.
Towers of Silence
Malabar Hill
Malabar Pt.
Back Bay
Colaba Pt.
Mahim Bay
Bandra
Kurla
Thana
Trombay
Elephanta
Uran
0 2 4 6 MILES

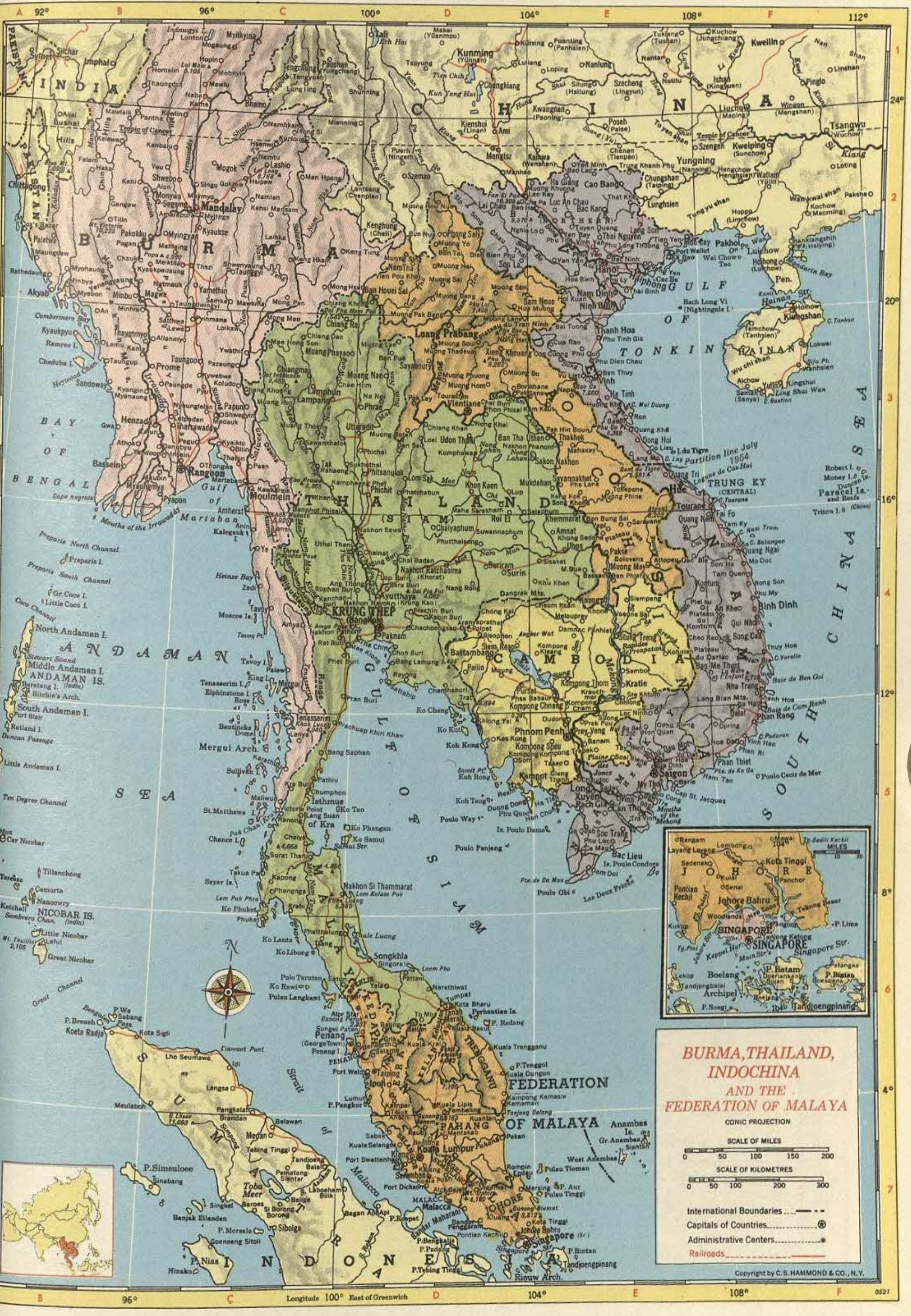
54 — NEAR EAST

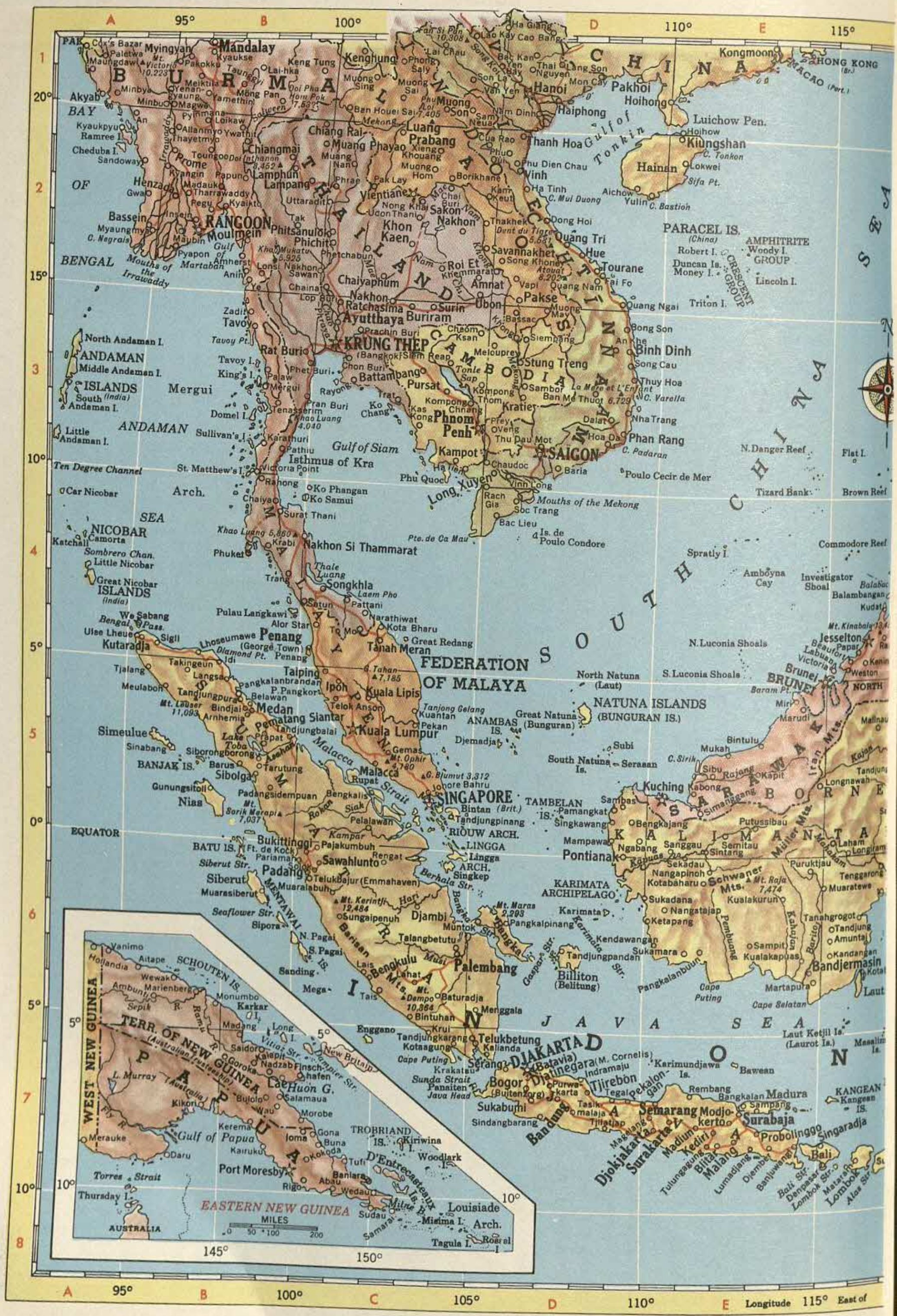


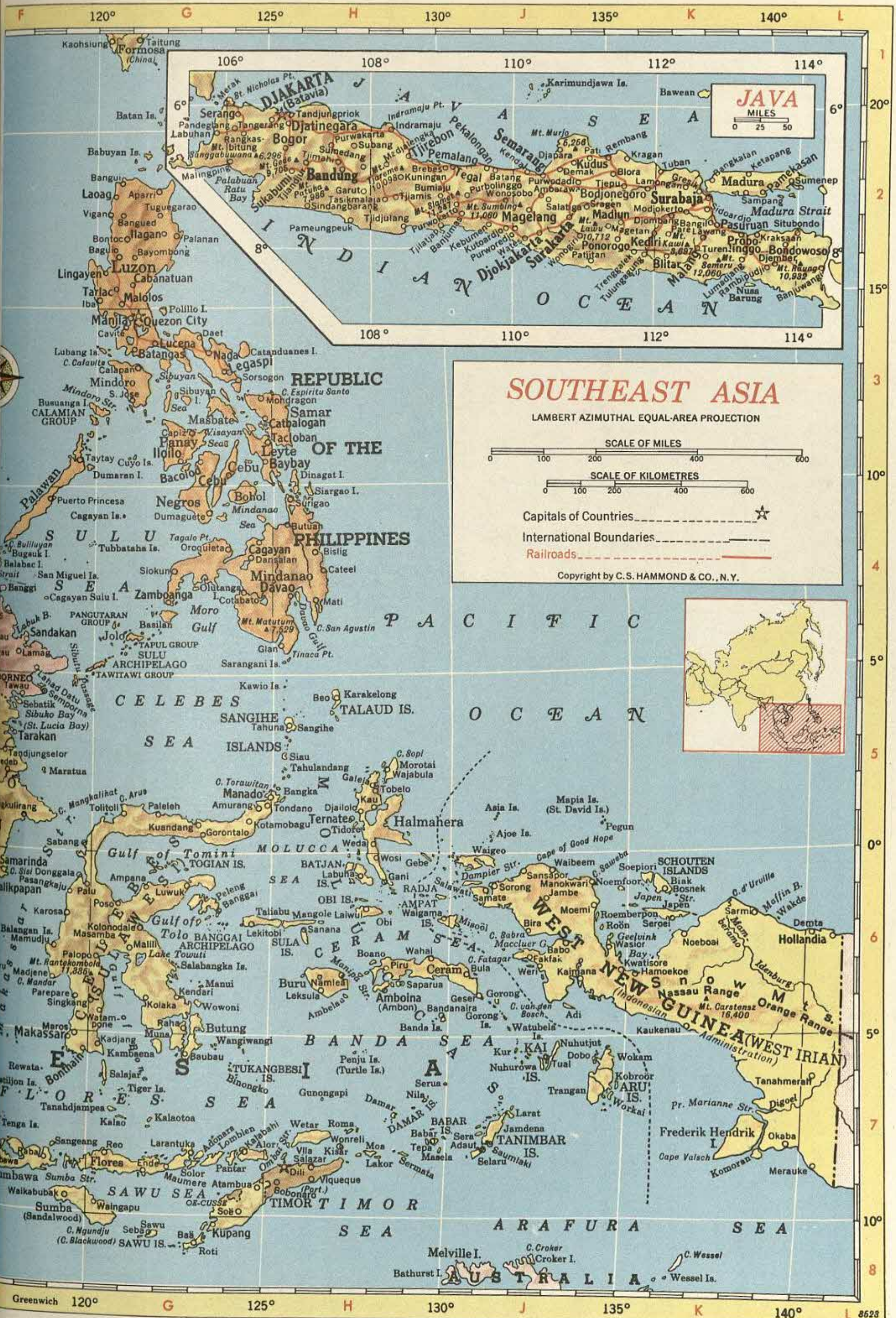
25°
30°
35°
40°
45°
50°
A
B
C
D
E
1
2
3
4
5
6
7
40°
35°
30°
25°
20°
15°
BLACK SEA
MEDITERRANEAN SEA
AEGEAN SEA
RED SEA
TURKEY
SYRIA
LEBANON
ISRAEL
JORDAN
IRAQ
CYPRUS
UNITED ARAB REPUBLIC
EGYPT
SUDAN
SAUDI ARABIA
YEMEN
ADEN PROTECTORATE
ETHIOPIA
ERITREA
KUWAIT
Neutral Zone
GREECE
U.S.S.R.
IRAN
Edirne
Istanbul
Üsküdar
Karadeniz Boğazı (Bosporus)
Marmara Denizi
Tekirdağ
Gelibolu
Çanakkale Boğazı (Dardanelles)
Çanakkale
Bandırma
İzmit
Adapazarı
Bursa
Balıkesir
Eskişehir
Bilecik
Bolu
Zonguldak
İnebolu
Kastamonu
Sinop
Bafra
Samsun
Ünye
Ordu
Giresun
Trabzon
Rize
Artvin
Amasya
Tokat
Çorum
Ankara
Yozgat
Polatlı
Kırşehir
Sakarya
Kızılırmak
Kütahya
Afyonkarahisar
Manisa
İzmir
Aydın
Uşak
Denizli
Burdur
Isparta
Muğla
Bodrum
Antalya
Antalya Körfezi
Alanya
Silifke
Konya
Akşehir
Beyşehir
Karaman
Ereğli
Niğde
Nevşehir
Kayseri
Sivas
Zara
Divriği
Malatya
Erzincan
Erzurum
Bayburt
Gümüşane
Kars
Sarıkamış
Elazığ
Muş
Bitlis
Van
Van Gölü
Diyarbakır
Siirt
Mardin
Urfa
Maraş
Gaziantep
Adana
Mersin
Tarsus
İskenderun
Antakya
Ceyhan
Seyhan
Toros Dağları
Ak Dağ
Doğu Karadeniz Dağları
Tuz Gölü
Emir Dağı 5,576
Kızıl Tepe 8,936
Kara Dağ 7,119
Bagir Dağı 10,908
Süphan Dağı 13,697
Büyük Ağrı (Ararat) 16,945
Çapakçur
Arapkir
Develi
Hozat
Murat
Batumi
Kobuleti
Poti
Kutaisi
Tskhinvali
Gori
Borzhomi
Tbilisi
Rustavi
Leninakan
Kirovakan
Kirovabad
Yerevan
Nakhichevan'
Nukhao
Zakataly
Derbent
G. Kazbek 16,546
G. Alagez 13,442
Sevan
Oz. Sevan
Stepanakert
Agdam
Akhty
Kuba
Lenkoran
Tabriz
Khoi
Marand
Dzhul'fa
Rezaieh (Urmia)
L. Urmia
Maragheh
Mianeh
Ardebil
Savalan 14,000
Resht
Zenjan
Kazvin
Mehabad
Saqqiz
Sinneh
Marivan
Hamadan
Kangavar
Malayer
Sultanabad
Kermanshah
Burujird
Khurramabad
Dizful
Shushtar
Ahwaz
Khorramshahr
Abadan
Mosul
Erbil (Arbela)
Sulaimanya
Kirkuk
Qal'a Sharqat
Tikrit
Khanaqin
Samarra
Haditha
'Ana
Hit
Ramadi
Falluja
Habbaniya
Baghdad
Kadhimain
Ba'quba
Al 'Aziziya
Kut al Imara
Karbala
An Najaf
Hilla
Al Musaiyib
Samawa
An Nasiriya
Al Qurna
Basra
'Amara
Rutba
Ar Rahhaliya
Shithatha
Mukur
Jadidat 'Ar'ar
Tigris
Euphrates
Khabur
Wadi Hauran
El Hamad (Syrian Desert)
Tell Kochek
El Haseke
Aleppo (Haleb)
Meskene
Raqqa
Deir ez Zor
Meyadin
Abu Kemal
Hama
Homs
Tadmor (Palmyra)
Es Sukhne
Beirut
Tarabulus (Tripoli)
El Ladhiqiya (Latakia)
Damascus (Dimishq)
En Nebk
Es Suweida
Haifa
Tel Aviv
Jaffa
Sea of Galilee
Es Salt
Amman
Jerusalem
Hebron
Dead Sea
El Kerak
Kaf
Wadi Sirhan
Ma'an
'Aqaba
Gulf of Aqaba
Mudauwara
Jebel Aneiza 3,100
Nicosia
Famagusta
Larnaca
Limassol
C. Gata
C. Kormakiti
C. Acamas
Anamur Burnu
Gelidonia Burun
Rodos (Rhodes)
Krete (Crete)
Erákleion
Thasos
Imroz
Lesvos
Khios
Samos
Andros
Ayvalık
Bergama
Tire
Söke
Menderes
Sidi Barrani
Mersa Matruh
El Alamein
El Hammam
Alexandria (El Iskandariya)
Rosetta (Rashid)
Damietta (Dumyat)
Port Said (Bur Sa'id)
Damanhur
Tanta
El Mansura
Zagazig
El Qantara
Ismailia
Suez Canal
El Arish
El Gaza
El Giza
Helwan
Cairo (El Qahira)
Suez
Jeb. Yelleq
Sinai Pen.
Taba
Mt. Sinai
Gulf of Suez
Jeb. Gharib 5,740
Jeb. Shayib 7,163
El Faiyum
Beni Suef
Maghagha
Samalut
El Minya
Mallawi
Manfalut
Asyut
Tahta
Sohag
Akhmim
Girga
Qina (Qena)
Luxor
El Karnak
Isna
Idfu
Kom Ombo
Aswan
Aswan Dam
1st Cataract
Kalabsha
Ed Dirr
Arminna
Farriq
Faris
Adindan
Kurusku
El Allaqi
El Madiq
Wadi Halfa
2nd Cataract
Nile
Arabian Desert
Qattara Depression
Bahariya Oasis
Mandisha
Farafra Oasis
El Farafra
Dakhla Oasis
El Qasr
Mut
Kharga Oasis
El Kharga
Bulaq
Dush
Baris
Safaga
El Qoseir
Ras Mohammed
Shadwan
Ras Banas
Jez. Zeberjed
Jeb. Nugrus 4,936
Jeb. Hamada 6,487
Ras Abu Daru
Halaib
Jeb. Adar Qaga 5,857
Jeb. Oda 7,409
Muhammad Qol
Nubian Desert
Akasha
Abri
3rd Cataract
Kerma
Argo
Dongola
El Khandaq
Kareima
Merowe
4th Cataract
Debba
Korti
Abu Hamed
5th Cataract
Abidiya
Berber
Atbara
Ed Damer
6th Cataract
Shendi
Wadi el Melik
Omdurman
Khartoum
Khartoum North
Abu Deleiq
El Kamlin
Rufa'a
Blue Nile
White Nile
Wad Medani
Shabasha
Ed Dueim
Sennar
Sennar Dam
Singa
Es Suki
Dinder
Kosti
Umm Ruwaba
El Obeid
Bara
Er Rahad
Abu Zabad
Barankwa
Gedaref
Moqatta
Kassala
Adarama
Sinkat
Port Sudan
Suakin
Tokar
Haiya
Baraka
Ras Kasar
Cheren
Agordat
Massawa
Asmara
Adi Ugri
Adua
Gondar
Assab
Bab el Mandeb
Perim (Br.)
Archipelago Dahlach
Dahlach Chebir
Jez. Farasan
Kamaran I. (Br.)
Muwaila
Dhaba
Midian
Wejh
Mashabi
Shaibara
Umm Lajj
Ras Abu-mad
Ras Barida
Yenbo
Abu Markha
Nakhl Mubarak
Jeb. Subh 4,501
Hajariya
Mastura
Rabigh
Qadhima
Ras Hatiba
Jidda
Ras al Aswad
Ras Abu Shagara
Mecca
Taif
Ashaira
Khuff
Sadiya
Al Lith
Doqa
Al Qunfidha
Halli
Al Qahm
Sabiya
Jizan
Abu 'Arish
Maqna
Tebuk
Akhdar
Al Muadhdham
Taima
Dar al Hamra
Medain Salih
Al 'Ala
Khaibar
Hadiya
Hanakiya
Medina
Jauf
Sakaka
Nefud (Red Desert)
Jebel Shammar
Jubba
Hail
Qafar
Jeb. Salma
Faid
Mustajidda
Qusaiba
Ayun
Buraida
Anaiza
Wadi er Rumma
Er Ras
Mudhnib
Zilfi
Majma'a
Al Auda
Arma Plateau
Shaqra
Rumaihiya
Abqaiq
Dhariya
Duwadami
Haraimala
Dhurma
Riyadh
Manfuha
Dilam
Yamama
Hariq
Hauta
Tropic of Cancer
Sufeina
Iqba
Khurs
Jabrin
Hamar
Gail
Laila
Haddar
Salma
Khurma
Qunsuliya
Hadhb Dawasir
Wadi Dawasir
Nefud Dahi
Turaba
Mendak
'Aqiq
W. Ranya
W. Bisha
Dam
Tamra
Sulaiyil
Hamam
Junaina
Bisha
Debaba
Muhail
Abha
Khamis Mushait
Haraja
Najran
Maqlaf
Sa'ada
Khaiwan
Maida
Luhaiya
Amran
Manakha
San'a
Marebo
Raghwan
Harib
Hodeida
Bait al Faqih
Zabid
Makhadar
Dhamar
Yarim
Jeb. Manar 10,666
Ibb
Ta'izz
Jeb. Sabir 9,867
Mocha
Zuqar
Hanish Is.
Sheikh Sa'id
Lahej
Sheikh Othman
Aden
Shugra
Lodar
Beidha
Nisab
Dakhla
Ahwar
Magatin
Yeshbum
Habban
Hisan
Dhulaa
Shabwa
Hureidha
Hajarain
Sailan
Sakwa
Al Hauta
Shibam
Saiun
Tarim
Hadhramaut
Mukalla
Bir Ali
Ras Asida
Haura
Arqa
Rub' al Khali
Bahr es Safi (Al Ahqaf)
Wadi al Batin
Hajar
Birkat al Jumaimah
Qasr al Haiyanya
Bir Ansab
Truba
Qasr 'Uthaimin
Bir al Mana'iyah
Al Kuwait
Burgan
Bubiyan I.
Abu Hadriya
Kahafa
Qasr es Sabiya
Dhahran
Hofuf
Summan
Dibdiba
Persian Gulf

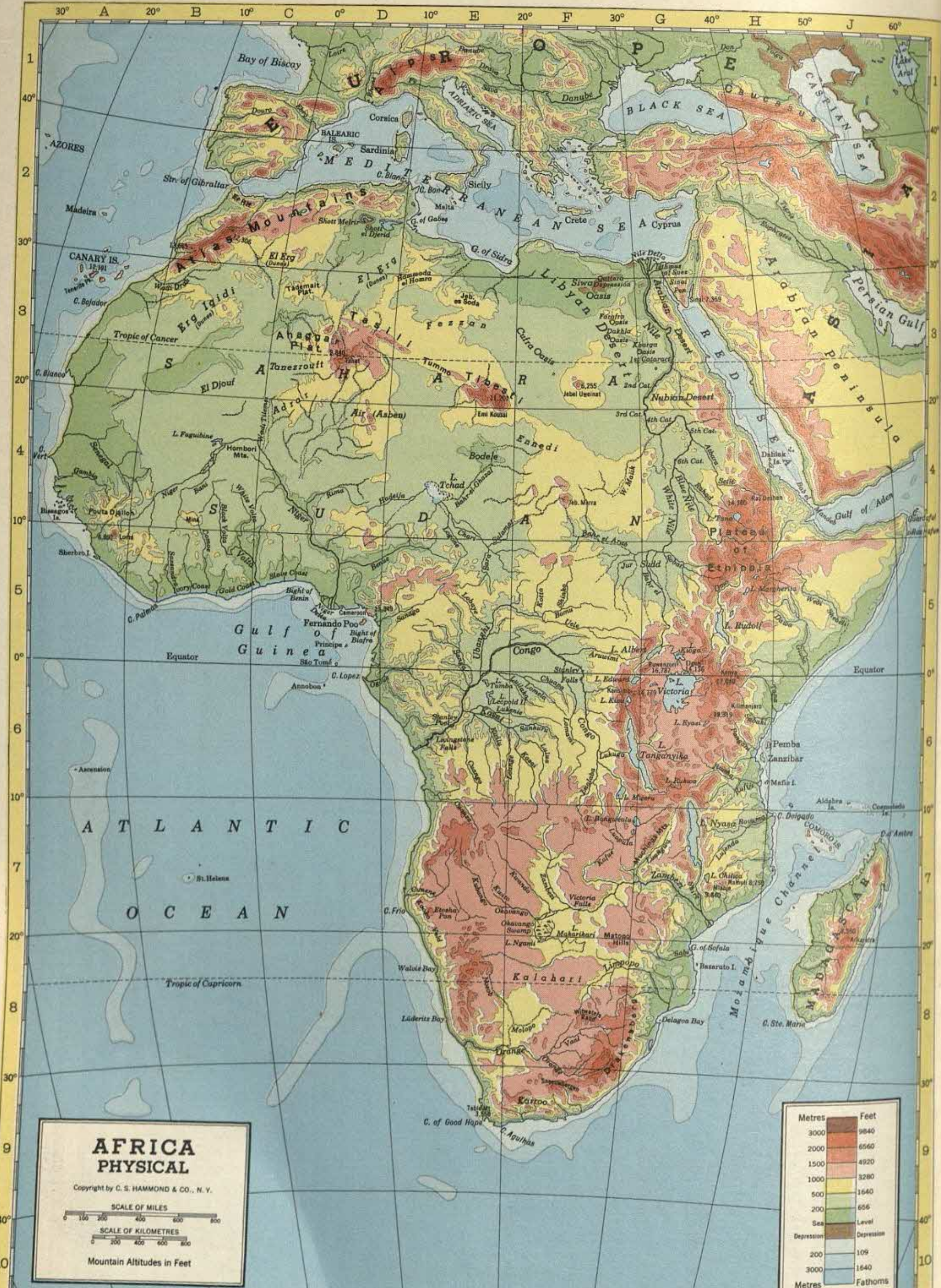

THE NEAR EAST
CONIC PROJECTION
SCALE OF MILES
SCALE OF KILOMETRES
Capitals of Countries
International Boundaries
Railroads
Copyright by C.S. HAMMOND & CO., N.Y.
Longitude
East of
Greenwich
55°
60°
65°
70°
75°
40°
35°
30°
25°
20°
15°
CASPIAN SEA
Zaliv Kara-Bogaz-Gol
Krasnovodsk
Peski Kara Kum
Peski Kyzyl-Kum
U.S.S.R.
Tashkent
Namangan
Andizhan
Kokand
Samarkand
Bukhara
Chardzhou
Dushanbe
Ashkhabad
Mary
Termez
CHINA
Sinkiang
Pamir
Hindu Kush
Tehran
Damavand 18,600
Meshed
Nishapur
Sabzawar
Semnan
Qum
Kashan
Isfahan
Yezd
Kerman
Shiraz
Dasht-i-Kavir
Dasht-i-Lut
IRAN
Bandar'Abbas
Lingeh
AFGHANISTAN
Kabul
Herat
Kandahar
Mazar-i-Sharif
Ghazni
Farah
Registan
Paropamisus
Peshawar
Rawalpindi
Lahore
Amritsar
Multan
Quetta
Kalat
PAKISTAN
Hyderabad
Karachi
Srinagar
Jammu
Kashmir
INDIA
Thar or Indian Desert
Bikaner
Jodhpur
Ahmedabad
Rann of Cutch
Gulf of Cutch
PERSIAN GULF
GULF OF OMAN
BAHREIN
QATAR
TRUCIAL OMAN
Abu Dhabi
Sharja
Dibah
Masqat
Matrah
SULTANATE OF OMAN
Ar Rimal
Rub' al Khali
HADHRAMAUT PROTECTORATE
Bay of Qamr
Saugira Bay
KURIA MURIA IS. (Br.)
ARABIAN SEA
N

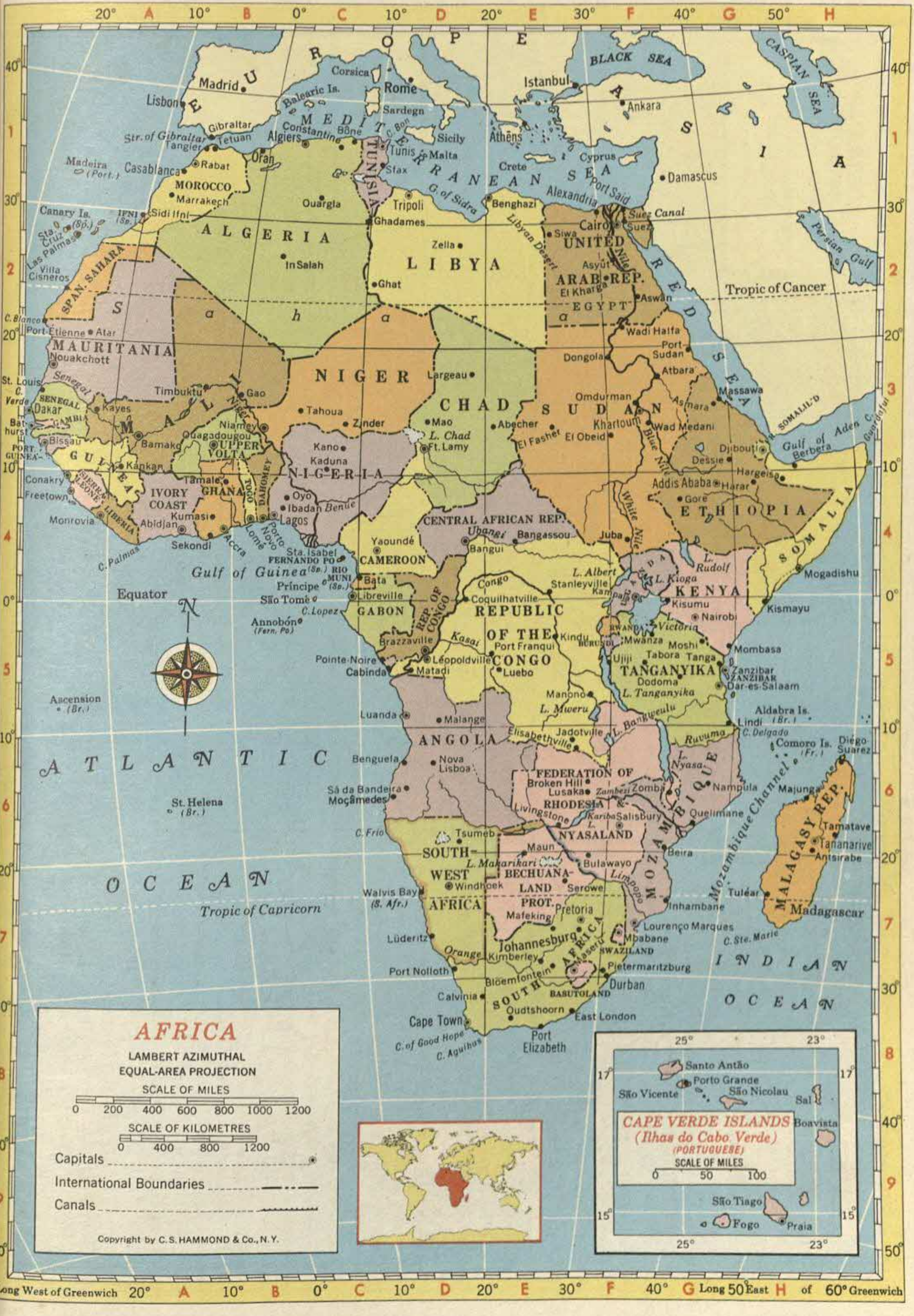

ISRAEL and JORDAN
CYLINDRICAL PROJECTION
Copyright by C.S. HAMMOND & CO., N.Y.
SCALE OF MILES
0 5 10 15 20 25 30
SCALE OF KILOMETRES
0 5 10 15 20 25 30
Capitals of Countries
District and Provincial Capitals
International Boundaries
District and Provincial Boundaries
Demilitarized Zone Boundaries
Neutral Zone Boundaries
Railroads
A
30′
B
35°
C
30′
D
36°
E
1
2
3
4
5
6
33°
30′
32°
31°
MEDITERRANEAN SEA
N
En Nabatiye
Merj 'Uyun
Litani
Hasbani
9,232
Mt. Hermon
Kiswe
Metulla
Sur (Tyre)
Dan
Kefar Gil'adi
Qana
Qiryat Shemona
Baniyas
Dafna
Tibnin
SYRIA
LEBANON
Kefar Blum
Yiftah
En Naqura
Bent Jubail
El Quneitra
Rosh Haniqra
Malkiya
Yesud Hama'ala
Shomera
Gesher Haziv
Qarn
Es Sanamein
Nahariya
Me'ona
Mt. Jarmaq 3,963
Gush Halav
Mishmar Hayarden
Shavei Zion
Kafr Yasif
Acre (Ako)
Yirqa
NORTHERN
Rama
Safad
Rosh Pinna
Rafid
Tibne
GALILEE
Bay of Acre
Maghar
Nawa
Qir. Yam
Qir. Haiyim
Qir. Motzkin
Qir. Bialik
Sakhnin
'Arraba
Ginnosar
Lake Tiberias (Sea of Galilee)
Cape Carmel
Shefar'am
Migdal
Fiq
El 'Al
Wadi er Raqqad
Haifa
Kefar Ata
Tsipori
Tur'an
Tiberias
Sheikh Miskin
Wadi el Harir
Tirat Karmel
Nesher
Yaqur
Kafr Kanna
Kinneret
Mt. Carmel
1,732
Tiv'on
Yavneel
Tsemah
Daliyat el Karmel
'Atlit
Nazareth
Mt. Tabor 1,929
Afiqim
Yarmuk
Er Rafid
Neve Yam
Iksal
Ashdot Ya'aqov
Samar
Habonim
Yoqne'am
Naharayim
Wadi esh Shallala
Dor
Kishon
Elyaqim
'Afula
Gesher
Ma'ad
Harima
Der'a
Bat Shelomo
Megiddo
'Ein Harod
Qumeim
Irbid
Nassib
Zikhron Ya'aqov
Umm el Fahm
Zububa
Er Ramtha
Binyamina
Muqeibila
Waqqas
Et Taiyiba
Hawara
Jabir
Pardes Hanna
HAIFA
'Anin
Sedot Yam
Karkur
Birqin
Jalama
Beit Shean
Deir Abu Sa'id
El Husn
Hadera
Qaffin
Ya'bad
Jenin
Jalbun
Kefar Ruppin
3,372
Kitim
Giv'at Haiyim
'Arraba
Qabatiya
Tirat Tsevi
Wadi el Yabis
'AJLUN
Mikhmoret
Ez Zababida
Kefar Vitkin
'Attil
'Ajja
'Anza
'Aqqaba
'Ajlun
3,929
Avihayil
Elyashiv
Shuweika
Jaba'
Siris
'Ibbin
El Mafraq
Natanya
'Attara
Kefar Yona
Tulkarm
Tubas
W. Kufrinja
Jebel 'Ajlun
'Anjara
3,990
Jarash
El Madwar
Qadima
Burqa
Even Yehuda
Sabastiya
NABLUS
Tammun
El Kitta
Shefayim
CENTRAL
Taiyiba
Mt. Ebal 3,084
Kuraiyima
3,601
Bal'ama
Ra'anana
Kefar Sava
Falama
Herzliya
Deir Sharaf
Rafidiya
Nablus (Nabulus)
El Majdal
Ramat Hasharon
Qalqiliya
Jordan
Zarqa
Subeihi
Er Rumman
Es Sukhna
Benei Beraq
Magdiel
SAMARIA
Hayarqon
Hadar Ramatayim
Haris
'Aqraba
Um Jauza
Ramat Gan
Petah Tiqva
Salfit
Qabalan
JORDAN
Deir Ballut
3,651
Tel Aviv-Jaffa
TEL AVIV
Jalud
Damiya
Es Salt
Ez Zarqa'
Yehud
'Arura
Duma
Nabi Yusha'
Safut
Bat Yam
Azor
Rantis
Sinjil
Suweilih
Er Ruseifa
Holon
Beit Dagon
Yabrud
Tell 'Asur 3,333
Marka
Rishon le Zion
Qibya
Bir Zeit
Jifna
Wadi es Sir
W. Shu'eib
Rubin
Lydda (Lod)
Ni'lin
Rammun
Amman
Nes Ziyona
Ramle
AMMAN (EL ASIMA)
Zarnoqa
Rehovot
Ramallah
El Bira
Jericho (Ariha)
Es Sahab
Yavne
Giv'at Brenner
Shunat Nimrin
Na'ur
Gedera
Yesodot
Latrun
Biddu
Shu'fat
'Atarot
JERUSALEM
Beit Ha'arava
BALQA
Gan Yavne
Hartuv
Beit Nuba
'Imwas
Motsa
Suweima
El 'Al
El Yaduda
Hisban
Yavne
Beer Tuvya
Yevadim
Jerusalem
Khirbet Qumran
Mt. Nebo 2,631
Nitsanim
Beit Shemesh
'Ein Kerem
Lakhish
JERUSALEM
Bethlehem (BeitLahm)
Manja
Ma'daba
Ashqelon
Hodiya
Qedma
Kefar Zekharya
Beit Jala
Beit Sahur
Zuweiza
Mavqi'im
Negba
Nahhalin
W. Mashash
Ma'in
Nitil
Yad Mordekhai
Gevaram
Zavdiel
Gal-on
Beit Fajjar
Gat
Kharas
Beit Guvrin
Tarqumiya
Shiqma
Helets
'Uza
Halhul
Beit Hanun
Ahuzam
Mt. Hebron 3,346
GAZA STRIP (U.A.R. Administration)
Jabaliya
Nir'am
'Idna
Dura
Hebron (El Khalil)
DEAD SEA
Gaza
Ruhama
JUDAEA
Sa'ad
Beit Qama
HEBRON
Er Rihiya
'Ein Gedi
Deir el Balah
Beeri
Beit Hagadi
Shoval
Dhahiriya (Ez Zahiriya)
Yatta
Bani Suheila
Gerar
Beit Re'im
Khan Yunis
'Abasan
Es Samu
Peduyim
Gilat
Mishmar Hanegev
Tseelim
Rafah
Magen
Urim
El Mazra'
Nir Yitshaq
Beersheba
'Omer
Borot Kidod
El Lisan
Hatserim
Habesor
Beer Sheva
Edh Dhira'
Mivtahim
Gevulot
Tseelim
Nevatim
Rosh Zohar
Beer Ef'e
Hemar
SOUTHERN
Beer Mashash
2,237
Dimona
Sedom
UNITED ARAB REPUBLIC EGYPT
Revivim
Kurnub
Salt
El Safi
W. el Hasa
Ghor
Pans
NEUTRAL ZONE
Mash-abei Sade
Kefar Yeroham
Tsin
Mt. Hatira 2,348
Oron
ARAB
KARAK
Beersheba
Dead Sea
El Karak
Dimona
EL
Revivim
Sedom
W. el-Hasa
SOUTHERN
Safi
KARAK
Sede Boqer
Et Tafila
El 'Auja
El Qusaima
Tsin
'Ein Hatseva
Dana
NEGEV
Mitspe Ramon
'Ein Yahav
Esh Shaubak
'Uneiza
Mt. Ramon 3,395
UNITED ARAB REPUBLIC
JORDAN
Paran
PETRA
Wadi Musa
Wadi 'Araba
Ma'an
El Kuntilla
Gharandal
Yotvata
Ra's en Naqb
EGYPT
Beer Ora
El Quweira
'Ein Netafim
Elath
Taba
G. of 'Aqaba
'Aqaba
MILES
0 10 20 30
35°
31°
30′
30
35° Longitude East of Greenwich


BURMA, THAILAND, INDOCHINA AND THE FEDERATION OF MALAYA
CONIC PROJECTION
SCALE OF MILES
0 50 100 150 200
SCALE OF KILOMETRES
0 50 100 200 300
International Boundaries
Capitals of Countries
Administrative Centers
Railroads
Copyright by C.S. HAMMOND & CO., N.Y.
Longitude 100° East of Greenwich
92°
96°
100°
104°
108°
112°
24°
20°
16°
12°
8°
4°
PAKISTAN
INDIA
CHINA
BURMA
THAILAND (SIAM)
CAMBODIA
LAOS
VIET NAM
FEDERATION OF MALAYA
INDONESIA
SUMATRA
BAY OF BENGAL
ANDAMAN SEA
GULF OF SIAM
GULF OF TONKIN
SOUTH CHINA SEA
Gulf of Martaban
Strait of Malacca
ANDAMAN IS.
NICOBAR IS.
Mergui Arch.
Isthmus of Kra
Partition line July 1954
TRUNG KY (CENTRAL)
Paracel Is.
HAINAN
Mandalay
Rangoon
Moulmein
Akyab
Bassein
KRUNG THEP (Bangkok)
Chiangmai
Vientiane
Luang Prabang
Hanoi
Haiphong
Hue
Tourane
Saigon
Phnom Penh
Battambang
Kunming
Penang
Ipoh
Kuala Lumpur
Malacca
Singapore
Medan
Johore Bahru
SINGAPORE
JOHORE
PAHANG
KEDAH
PERAK
KELANTAN
TRENGGANU
SELANGOR
Tropic of Cancer


A
95°
B
100°
C
105°
D
110°
E
115°
1
2
3
4
5
6
7
8
20°
15°
10°
5°
0°
5°
10°
BURMA
THAILAND
LAOS
VIETNAM
CAMBODIA
CHINA
MALAYA
SUMATRA
BORNEO
INDONESIA
SARAWAK
BRUNEI
KALIMANTAN
NORTH
PAK
Cox's Bazar
Paletwa
Myingyan
Mandalay
Kyaukse
Maungdaw
Mt. Victoria 10,223
Pakokku
Taunggyi
Lai-hka
Keng Tung
Kenghung
Phong Saly
Fan Si Pan 10,308
Lao Kay
Cao Bang
Ha Giang
Lai Chau
Bac Kan
Thai Nguyen
Lang Son
Son La
Yen Bay
Hanoi
Mon Cay
Pakhoi
Hoihong
Kongmoon
Macao (Port.)
Hong Kong (Br.)
Akyab
Minbya
Meiktila
Yenangyaung
Minbu
Magwe
Yamethin
Mong Pan
Loi Pha
Hom Pok 7,532
Muong Sing
Muong Sai
Phu Muong Loi 7,405
Son
Sam Neua
Nam Dinh
Haiphong
Gulf of Tonkin
Luichow Pen.
Hoihow
Kiungshan
C. Tonkin
Hainan
Lokwei
Sifa Pt.
BAY OF BENGAL
Kyaukpyu
Ramree I.
An
Pyinmana
Loikaw
Salween
Ban Houei Sai
Mekong
Luang Prabang
Allanmyo
Ywathit
Thayetmyo
Chiang Rai
Muang Phayao
Xieng Khouang
Cua Rao
Thanh Hoa
Cheduba I.
Sandoway
Prome
Toungoo
Doi Inthanon 8,452
Chiangmai
Muang Nan
Muongo Hom
Phu Dien Chau
Vinh
Kyangin
Papun
Lamphun
Lampang
Phrae
Pak Lay
Borikhane
Henzada
Madauk
Tharrawaddy
Gwa
Pegu
Kyaikto
Irrawaddy
Sittang
Uttaradit
Vientiane
Nong Khai
Sakon Nakhon
Kam Keut
Ha Tinh
C. Mui Duong
Aichow
Yulin
C. Bastion
Bassein
Insein
RANGOON
Moulmein
Myaungmya
C. Negrais
Maubin
Tak
Phitsanulok
Phichit
Udon Thani
Khon Kaen
Thakhek
Dent du Tigre 5,581
Dong Hoi
Quang Tri
PARACEL IS. (China)
AMPHITRITE GROUP
Woody I.
Robert I.
Duncan Is.
Money I.
CRESCENT GROUP
Lincoln I.
Pyapon
Gulf of Martaban
Amherst
Khao Mukatu 5,925
Phetchabun
Roi Et
Khemmarat
Savannakhet
Song Khone
Hue
Tourane
Atouat 8,202
Fai Fo
Mouths of the Irrawaddy
Anin
Lonsi
Nakhon Sawan
Ye
Chainat
Chaiyaphum
Amnat
Vapi
Quang Nam
Lop Buri
Nakhon Ratchasima
Surin
Ubon
Pakse
Muong May
Quang Ngai
Triton I.
Zadi
Tavoy
Ayutthaya
Buriram
Prachin Buri
Bassac
Tavoy Pt.
KRUNG THEP (Bangkok)
Chaom Ksan
Siempang
Bong Son
An Khe
Binh Dinh
North Andaman I.
ANDAMAN
Middle Andaman I.
ISLANDS
South Andaman I. (India)
Tavoy I.
King's I.
Rat Buri
Phet Buri
Palaw
Mergui
Chon Buri
Siem Reap
Tonle Sap
Battambang
Meloupre
Stung Treng
Song Cau
Thuy Hoa
Mergui
Rayong
Pursat
Kompong Thom
Sambor
La Mere et L'Enfant
Ban Me Thuot 6,729
C. Varella
Domel I.
Tenasserim
Kran Buri
Khao Luang 4,040
Trat
Ko Chang
Kas Kong
Kompong Chnang
Phnom Penh
Kratie
Prey Veng
Dalat
Nha Trang
Little Andaman I.
ANDAMAN SEA
Sullivan's I.
Karathuri
Pathiu
Gulf of Siam
Isthmus of Kra
Kampot
Thu Dau Mot
Hoa Da
Phan Rang
C. Padaran
SAIGON
N. Danger Reef
Flat I.
Ten Degree Channel
St. Matthew's I.
Victoria Point
Ha Tien
Phu Quoc
Chaudoc
Baria
Poulo Cecir de Mer
Car Nicobar
Arch.
Rahong
Ko Phangan
Ko Samui
Long Xuyen
Vinh Long
Rach Gia
Mouths of the Mekong
Tizard Bank
Brown Reef
Chaiya
Surat Thani
Soc Trang
Bac Lieu
NICOBAR
Camorta
Katchall
Khao Luang 5,880
Krabi
Pte. de Ca Mau
Is. de Poulo Condore
Sombrero Chan.
Little Nicobar
Phuket
Nakhon Si Thammarat
Spratly I.
Commodore Reef
Great Nicobar
ISLANDS (India)
Thale Luang
Trang
Songkhla
Laem Pho
Pattani
Amboyna Cay
Investigator Shoal
Balabac
Balambangan
Kudat
We
Sabang
Bengal Pass.
Ulee Lheue
Kutaradja
Sigli
Pulau Langkawi
Alor Star
Satun
Narathiwat
Kota Bharu
Mt. Kinabalu 13,455
Jesselton
Beaufort
Papar
Labuan
Victoria
Lhoseumawe
Penang (George Town)
Diamond Pt.
Idi
Penang
Tanah Meran
Great Redang
SOUTH CHINA SEA
N. Luconia Shoals
Tjalang
Takingeun
Langsa
Taiping
G. Tahan 7,185
FEDERATION OF MALAYA
North Natuna (Laut)
S. Luconia Shoals
Weston
Meulaboh
Pangkalanbrandan
Tandjungpura
P. Pangkor
Ipoh
Belawan
Kuala Lipis
Baram Pt.
Kenin
Mt. Leuser 11,093
Bindjai
Medan
Arnhemia
Telok Anson
Tanjong Gelang
Kuantan
NATUNA ISLANDS
Great Natuna (Bunguran)
(BUNGURAN IS.)
Miri
Marudi
Malinau
Simeulue
Pematang Siantar
Tandjungbalai
Kuala Lumpur
Pekan
ANAMBAS IS.
Djemadja
Sinabang
Lake Toba
Prapat
Asahan
Siborongborong
Malacca
Gemas
Mt. Ophir 4,180
Subi
Bintulu
Mukah
BANJAK IS.
Barus
Tarutung
Sibolga
Straits of Malacca
Malacca
Rupat
G. Blumut 3,312
Johore Bahru
South Natuna Is.
Serasan
C. Sirik
Kajan
Tandjung
Longnawah
Sibu
Rajang
Kapit
Gunungsitoli
Nias
Padangsidempuan
Bengkalis
Siak
SINGAPORE
TAMBELAN IS.
Sambas
Kuching
Kabong
Simanggang
Iran Mts.
Mt. Sorik Merapi 7,037
Rokan
Pelalawan
Bintan (Brit.)
Tandjungpinang
Pamangkat
Singkawang
Bengkajang
Putussibau
Müller Mts.
EQUATOR
Kampar
RIOUW ARCH.
Mampawa
Ngabang
Sanggau
Semitau
Sintang
Laham
Longiram
BATU IS.
Ft. de Kock
Bukittinggi
Pajakumbuh
Rengat
LINGGA ARCH.
Lingga
Pontianak
Kapuas
Sekadau
Mahakam
Siberut Str.
Pariaman
Padang
Sawahlunto
Singkep
Berhala Str.
Nangapinoh
Kotabaharu
Schwaner Mts.
Mt. Raja 7,474
Puruktjau
Tenggarong
Siberut
Muarasiberut
Telukbajur (Emmahaven)
Muaralabuh
Hari
Bangka Str.
KARIMATA ARCHIPELAGO
Sukadana
Nangatajap
Kualakurun
Muaratewe
MENTAWAI IS.
Seaflower Str.
Mt. Kerintji 12,484
Sungaipenuh
Djambi
Muntok
Mt. Maras 2,293
Pangkalpinang
Karimata Str.
Karimata
Ketapang
Tanahgrogot
Tandjung
Amuntai
Sipora
N. Pagai
S. Pagai
Barisan Mts.
Talangbetutu
Palembang
Bangka
Gaspar Str.
Kendawangan
Tandjungpandan
Sukamara
Pembuang
Sampit
Kahajan
Barito
Kualakapuas
Kandangan
Bandjermasin
Kotabaru
Sanding
Mega
Lais
Bengkulu
Musi
Lahat
Mt. Dempo 10,364
Baturadja
Billiton (Belitung)
Pangkalanbuun
Cape Puting
Martapura
Cape Selatan
Laut
Tais
Menggala
Bintuhan
JAVA SEA
Laut Ketjil Is. (Laurot Is.)
Masalima Is.
Enggano
Krui
Tandjungkarang
Telukbetung
Kotaagung
Kalianda
DJAKARTA (Batavia)
Tandjungpriok
Djatinegara
Indramaju
M. Cornelis
Karimundjawa Is.
Bawean
Cape Puting
Krakatau
Serang
Sunda Strait
Panaitan
Java Head
Bogor (Buitenzorg)
Purwakarta
Tjirebon
Tegal
Pekalongan
Rembang
Bangkalan
Madura
KANGEAN IS.
Kangean
Sukabumi
Bandung
Tasikmalaja
Tjilatjap
Semarang
Modjokerto
Surabaja
Sampang
Sindangbarang
Magelang
Djokjakarta
Surakarta
Madiun
Kediri
Probolinggo
Singaradja
Tulungagung
Blitar
Malang
Lumadjang
Djember
Banjuwangi
Bali
Bali Str.
Denpasar
Lombok Str.
Lombok
Mataram
Alas Str.
EASTERN NEW GUINEA
MILES
0
50
100
200
145°
150°
5°
10°
Vanimo
Hollandia
Aitape
SCHOUTEN IS.
Wewak
Ambunti
Marienberg
Sepik
Monumbo
Karkar
Ramu
R.
WEST NEW GUINEA
TERR. OF NEW GUINEA (Australian Trusteeship)
Madang
Long I.
Vitiaz Str.
Saidor
Kaiapit
Goroka
Nadzab
Finschhafen
Dampier Str.
New Britain
PAPUA (Australia)
L. Murray
Lae
Huon G.
Salamaua
Kikori
Bulolo
Wau
Morobe
Fly R.
Merauke
Gulf of Papua
Kerema
Gona
Buna
Ioma
TROBRIAND IS.
Kiriwina
Kairuku
Kokoda
Tufi
Woodlark I.
Daru
D'Entrecasteaux Is.
Torres Strait
Port Moresby
Abau
Banlara
Rigo
Wedau
Thursday I.
Milne B.
Louisiade Arch.
Sudau
Samarai
Misima I.
AUSTRALIA
Tagula I.
Rossel I.
Longitude 115° East of


SOUTHEAST ASIA
LAMBERT AZIMUTHAL EQUAL-AREA PROJECTION
SCALE OF MILES
0 100 200 400 600
SCALE OF KILOMETRES
0 100 200 400 600
Capitals of Countries ☆
International Boundaries
Railroads
Copyright by C.S. HAMMOND & CO., N.Y.
JAVA
MILES
0 25 50
F G H J K L
120° 125° 130° 135° 140°
106° 108° 110° 112° 114°
6° 8°
20° 15° 10° 5° 0° 5° 10°
1 2 3 4 5 6 7 8
Greenwich
8523
DJAKARTA (Batavia)
St. Nicholas Pt.
Merak
Serang
Pandeglang
Tangerang
Labuhan
Tandjungpriok
Djatinegara
Indramaju
Indramaju Pt.
Rangkas-bitung
Bogor
Purwakarta
Subang
Mt. Ibitung
Sanggabuwana 6,296
Mt. Gede 9,705
Tjimahi
Sumedang
Tjirebon
Pemalang
Pekalongan
Semarang
Kendal
Djapara
Pati
Rembang
Kragan
Tuban
Bangkalan
Ketapang
Pamekasan
Sumenep
Madura
Sampang
Madura Strait
Malingping
Palabuhan Ratu Bay
Sukabumi
Tjiandjur
Bandung
Mt. Patuha 7,986
Garut
Tasikmalaja
Sindangbarang
Tjiamis
Kuningan
Brebes
Tegal
Bumiaju
Mt. Slamet 11,247
Purbolinggo
Wonosobo
Ambarawa
Salatiga
Sragen
Kudus
Demak
Blora
Tjepu
Lamongan
Gresik
Bodjonegoro
Surabaja
Modjokerto
Sidoardjo
Pasuruan
Situbondo
Bangil
Pare
Lawang
Probolinggo
Kraksaan
Bondowoso
Djember
Mt. Raung 10,932
Banjuwangi
Magelang
Mt. Sumbing 11,060
Madiun
Mt. Lawu 10,712
Magetan
Ngawi
Ponorogo
Kediri
Mt. Kawi 8,697
Turen
Mt. Semeru 12,060
Lumadjang
Rambipudji
Nusa Barung
Malang
Blitar
Patjitan
Trenggalek
Tulungagung
Wonogiri
Surakarta
Djokjakarta
Wates
Purworedjo
Kutoardjo
Kebumen
Purwokerto
Bandjumas
Tjilatjap
Tjidjulang
Pameungpeuk
Karimundjawa Is.
Bawean
Mt. Murjo 5,256
J A V A S E A
I N D I A N O C E A N
Kaohsiung
Taitung
Formosa (China)
Batan Is.
Babuyan Is.
Bangui
Laoag
Aparri
Vigan
Tuguegarao
Bangued
Bontoc
Ilagan
Palanan
Baguio
Bayombong
Lingayen
Luzon
Cabanatuan
Tarlac
Iba
Malolos
Polillo I.
Manila
Quezon City
Cavite
Daet
Lucena
Lubang Is.
Batangas
Naga
Catanduanes I.
C. Calavite
Calapan
Legaspi
Mindoro
Sibuyan
Sorsogon
Mindoro Str.
S. Jose
Sibuyan Sea
C. Espiritu Santo
Mondragon
Busuanga I.
CALAMIAN GROUP
Samar
Masbate
Catbalogan
Capiz
Visayan Sea
Tacloban
Panay
Iloilo
Leyte
Cebu
Baybay
Taytay
Cuyo Is.
Dumaran I.
Bacolod
Dinagat I.
Palawan
Siargao I.
Puerto Princesa
Negros
Bohol
Surigao
Cagayan Is.
Dumaguete
Mindanao Sea
REPUBLIC OF THE PHILIPPINES
Butuan
Tagalo Pt.
Tubbataha Is.
Oroquieta
Cagayan
Bislig
Dansalan
Bulluyan
Bugsuk I.
Balabac I.
Balabac Strait
Siokun
Mindanao
Cateel
San Miguel Is.
Davao
Cagayan Sulu I.
Zamboanga
Cotabato
Mati
S U L U S E A
Moro Gulf
Mt. Matutum 7,529
Davao Gulf
C. San Agustin
Labuk B.
PANGUTARAN GROUP
Basilan
Sandakan
Jolo
TAPUL GROUP
SULU ARCHIPELAGO
Glan
Tinaca Pt.
Lamag
Sarangani Is.
TAWITAWI GROUP
Sibutu Passage
BORNEO
Tawau
Dent
Lahad Datu
Semporna
Sebatik
Sibuko Bay (St. Lucia Bay)
Tarakan
Tandjungselor
Maratua
Kawio Is.
Beo
Karakelong
TALAUD IS.
C E L E B E S S E A
SANGIHE ISLANDS
Tahuna
Sangihe
Siau
Tahulandang
C. Sopi
Morotai
Wajabula
P A C I F I C O C E A N
C. Torawitan
Manado
Bangka
Galela
Tobelo
Kau
C. Mangkalihat
C. Arus
Tolitoli
Paleleh
Amurang
Tondano
Djailolo
Halmahera
Kuandang
Gorontalo
Kotamobagu
Ternate
Tidore
Weda
Asia Is.
Mapia Is. (St. David Is.)
Pegun
Ajoe Is.
Sangkulirang
Sabang
Makassar Str.
Gulf of Tomini
TOGIAN IS.
M O L U C C A S E A
BATJAN
Labuha
Wosi
Gebe
Gani
Waigeo
Cape of Good Hope
Dampier Str.
Waibeem
Sausapor
Sorong
Samate
Manokwari
Jambe
Soepiori
SCHOUTEN ISLANDS
Biak
Noemfoor
Bosnek
Japen Str.
Japen
C. d'Urville
Sarmi
Moffin B.
Wakde
Demta
Hollandia
Samarinda
C. Sisi Donggala
Balikpapan
Pasanngkaju
Palu
Ampana
Luwuk
Peleng
Banggai
OBI IS.
RADJA AMPAT IS.
Salawati
Waigama
Misool
Taliabu
Mangole
Laiwui
Obi
Poso
Karosa
Kolonodale
Gulf of Tolo
BANGGAI ARCHIPELAGO
Lekitobi
Sanana
SULA IS.
C E R A M S E A
C. Sabra
Maccluer G.
Babo
Fakfak
Kaimana
Moemi
Bira
Roemberpon
Roon
Geelvink Bay
Wasior
Kwatisore
Hamoekoe
Noeboai
Mamberamo
Idenburg
S n o w M t s.
Nassau Range
Mt. Carstensz 16,400
Orange Range
Balangan Is.
Mamudju
Masamba
Malili
Lake Towuti
Salabangka Is.
Palopo
Mt. Rantekombola 11,335
Madjene
C. Mandar
Parepare
Singkang
Kendari
Manui
Wowoni
Kolaka
Watampone
Maros
Makassar
Raha
Muna
Butung
Wangiwangi
Bonthain
Kadjang
Kambaena
Baubau
CELEBES
Salajar
Tiger Is.
Tanahdjampea
Kalaotoa
Tenga Is.
Kalao
Rewata
Postiljon Is.
F L O R E S S E A
Boano
Wahai
C. Fatagar
Weri
Buru
Namlea
Ceram
Bula
Manipa Str.
Saparua
Leksula
Amboina (Ambon)
Ambelau
Geser
Gorong
Bandanaira
Gorong Is.
C. vah den Bosch
Adi
Banda Is.
Watubela Is.
B A N D A S E A
Kur
KAI IS.
Nuhurowa
Tual
Nuhutjut
Dobo
Wokam
ARU IS.
Kobroor
Trangan
Workai
Kaukenau
NEW GUINEA (WEST IRIAN) (Indonesian Administration)
WEST NEW GUINEA
Tanahmerah
TUKANGBESI IS.
Binongko
Penju Is. (Turtle Is.)
Serua
Nila
Gunongapi
Damar
DAMAR IS.
Larat
Pr. Marianne Str.
Digoel
Jamdena
TANIMBAR IS.
Saumlaki
Selaru
BABAR IS.
Babar
Sera
Tepa
Adaut
Masela
Frederik Hendrik I.
Okaba
Cape Valsch
Komoran
Merauke
Sermata
Wetar
Roma
Wonreli
Moa
Lakor
Kisar
Vila
Salazar
Dili
Viqueque
Sangeang
Reo
Larantuka
Adonara
Lomblen
Kalabahi
Alor
Ombai Str.
Pantar
Solor
Sumbawa
Flores
Ende
Maumere
Atambua
Sumba Str.
Bima
Bobonaro (Port.)
Oe-cusse
Soe
TIMOR
Waikabubak
Waingapu
SAWU SEA
Sumba (Sandalwood)
C. Ngundju
Seba
Sawu
SAWU IS.
Baa
Kupang
Roti
C. Blackwood
T I M O R S E A
A R A F U R A S E A
Melville I.
Bathurst I.
C. Croker
Croker I.
C. Wessel
Wessel Is.
A U S T R A L I A


AFRICA
PHYSICAL
Copyright by C. S. HAMMOND & CO., N. Y.
SCALE OF MILES
SCALE OF KILOMETRES
Mountain Altitudes in Feet
Metres
Feet
3000
9840
2000
6560
1500
4920
1000
3280
500
1640
200
656
Sea
Level
Depression
Depression
200
109
3000
1640
Metres
Fathoms
EUROPE
Bay of Biscay
Alps
Danube
Drava
Sava
Loire
Douro
Corsica
Sardinia
BALEARIC IS.
ADRIATIC SEA
BLACK SEA
Caucasus
CASPIAN SEA
Lake Aral
Don
Volga
AZORES
Str. of Gibraltar
Madeira
CANARY IS.
Tenerife Pk.
C. Bojador
MEDITERRANEAN SEA
C. Blanc
C. Bon
Sicily
Malta
G. of Gabes
Crete
Cyprus
G. of Sidra
Shott Melrir
Shott el Djerid
Atlas Mountains
El Erg (Dunes)
Tademait Plat.
Hammada el Homra
Jeb. es Soda
Fezzan
Libyan Desert
Siwa Oasis
Qattara Depression
Farafra Oasis
Dakhla Oasis
Kharga Oasis
Cufra Oasis
Jebel Uweinat
6,255
Nile Delta
Isthmus of Suez
Sinai Pen.
Sinai 7,359
Arabian Desert
Nile
Nubian Desert
1st Cataract
2nd Cat.
3rd Cat.
4th Cat.
5th Cat.
6th Cat.
RED SEA
Tigris
Euphrates
Arabian Peninsula
Persian Gulf
ASIA
Erg Igidi (Dunes)
Wadi Dra
Tropic of Cancer
SAHARA
Ahaggar Plat.
Tahat
Tassili
Tanezrouft
El Djouf
Adrar
Air (Asben)
Tummo
Tibesti
Emi Koussi
C. Blanco
C. Vert
L. Faguibine
Hombori Mts.
Senegal
Gambia
Niger
Bani
Black Volta
White Volta
Volta
Bissagos Is.
Fouta Djallon
Sherbro I.
Loma
Mina
Ivory Coast
Gold Coast
Slave Coast
C. Palmas
SUDAN
Rima
Hadeija
Benue
Bight of Benin
Cameroon
Fernando Poo
Bight of Biafra
Principe
São Tomé
Annobon
Gulf of Guinea
Equator
L. Tchad
Bodele
Ennedi
Bahr el Ghazal
Jeb. Marra
Chari
Logone
W. Malik
White Nile
Blue Nile
L. Tana
Plateau of Ethiopia
Ras Dashan
Dahlak Is.
Gulf of Aden
C. Guardafui
Sudd
Jur
Sobat
Bahr el Jebel
Kotto
Mbomu
Uele
Sanaga
Lobaye
Ubangi
Congo
Aruwimi
L. Albert
L. Rudolf
Webi Shebeli
Juba
Ruwenzori
L. Edward
L. Kivu
Kenya
Victoria
Kilimanjaro 19,319
L. Eyasi
Stanley Falls
Tshuapa
Lomami
Lulonga
L. Tumba
L. Leopold II
Lukenie
Kasai
Sankuru
Ogowe
C. Lopez
Stanley Pool
Livingstone Falls
Cuango
Kwilu
Lualaba
Lukuga
Tanganyika
Pemba
Zanzibar
Mafia I.
L. Rukwa
L. Mweru
L. Bangweulu
Luapula
Muchinga Mts.
Luangwa
L. Nyasa
Ruvuma
Rufiji
C. Delgado
COMOROS
Aldabra Is.
Cosmoledo Is.
C. d'Ambre
MADAGASCAR
Ankaratra
C. Ste. Marie
Mozambique Channel
L. Chilwa
Mlanje
Zambezi
Shire
Kafue
Kabompo
Victoria Falls
Okavango
Okavango Swamp
L. Ngami
Makarikari
Matopo Hills
Cunene
Kwando
Etosha Pan
C. Frio
Walvis Bay
Kalahari
Limpopo
Sabi
G. of Sofala
Bazaruto I.
Delagoa Bay
Lüderitz Bay
Molopo
Orange
Vaal
Witwaters Rand
Drakensberg
Sneeuwbergen
Karroo
Table Mt.
C. of Good Hope
C. Agulhas
Tropic of Capricorn
Ascension
St. Helena
ATLANTIC OCEAN
Longitude West of Greenwich
Longitude East of Greenwich
30°
20°
10°
0°
40°
50°
60°
A
B
C
D
E
F
G
H
J
1
2
3
4
5
6
7
8
9
10



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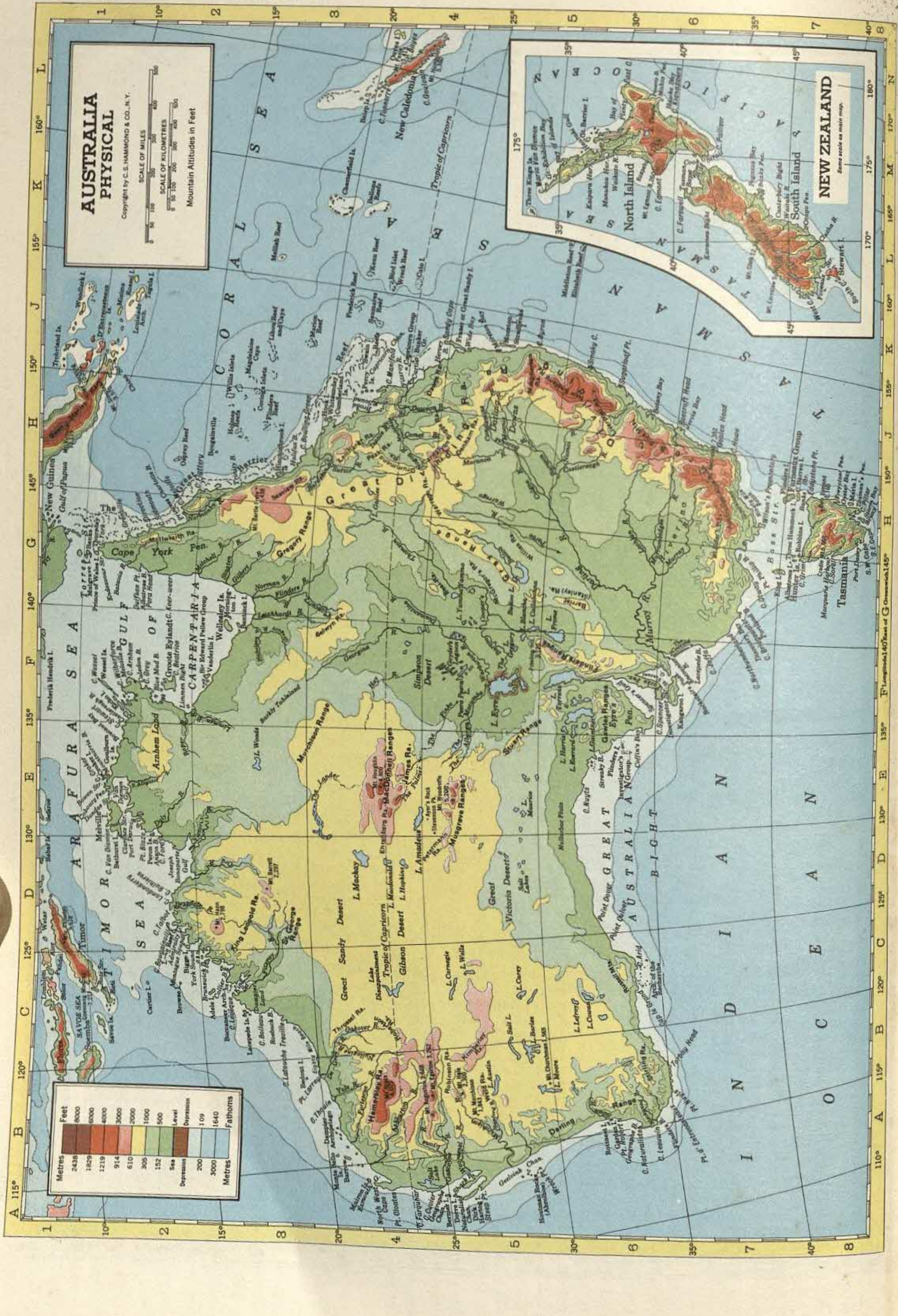
AUSTRALIA
PHYSICAL
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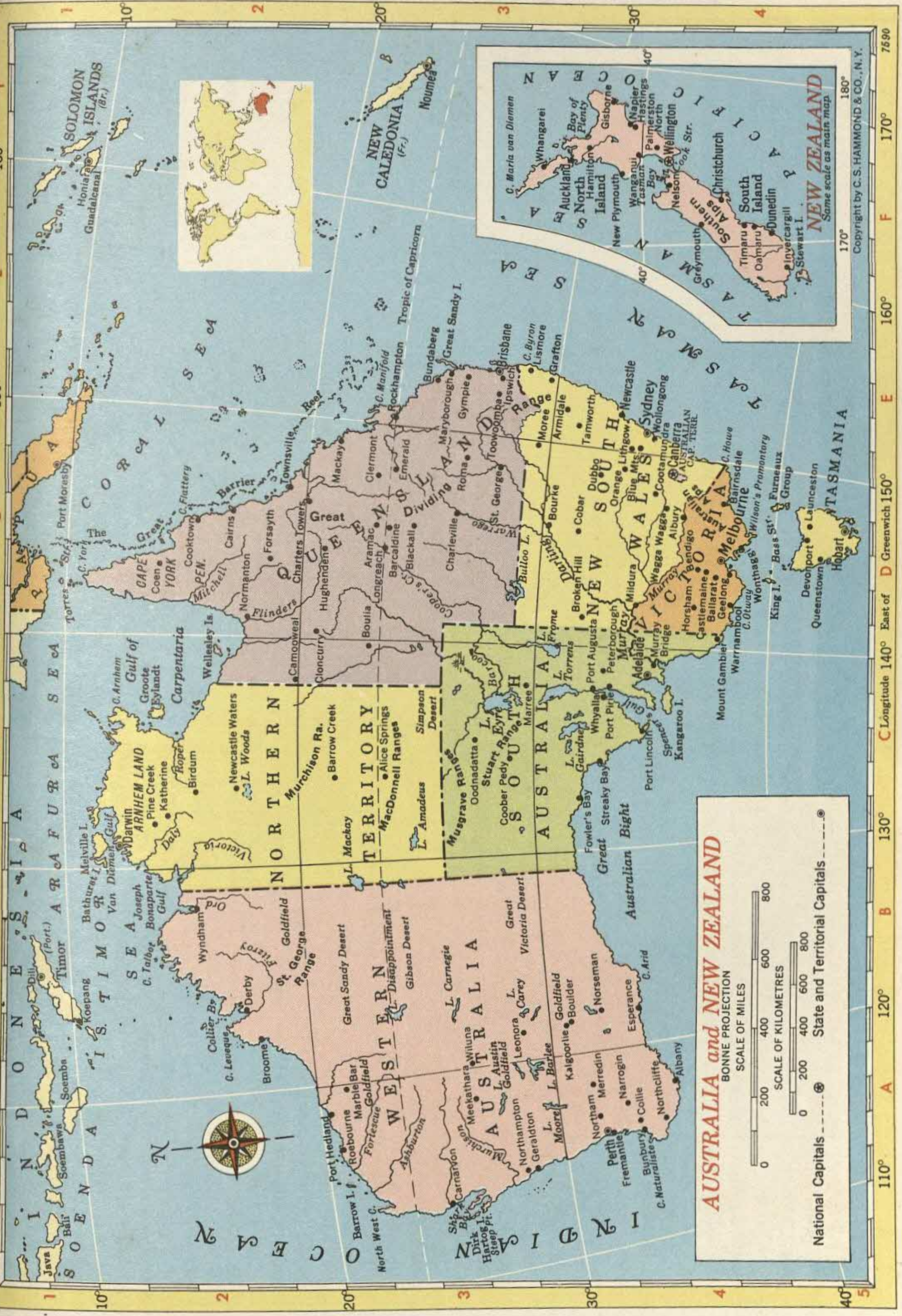
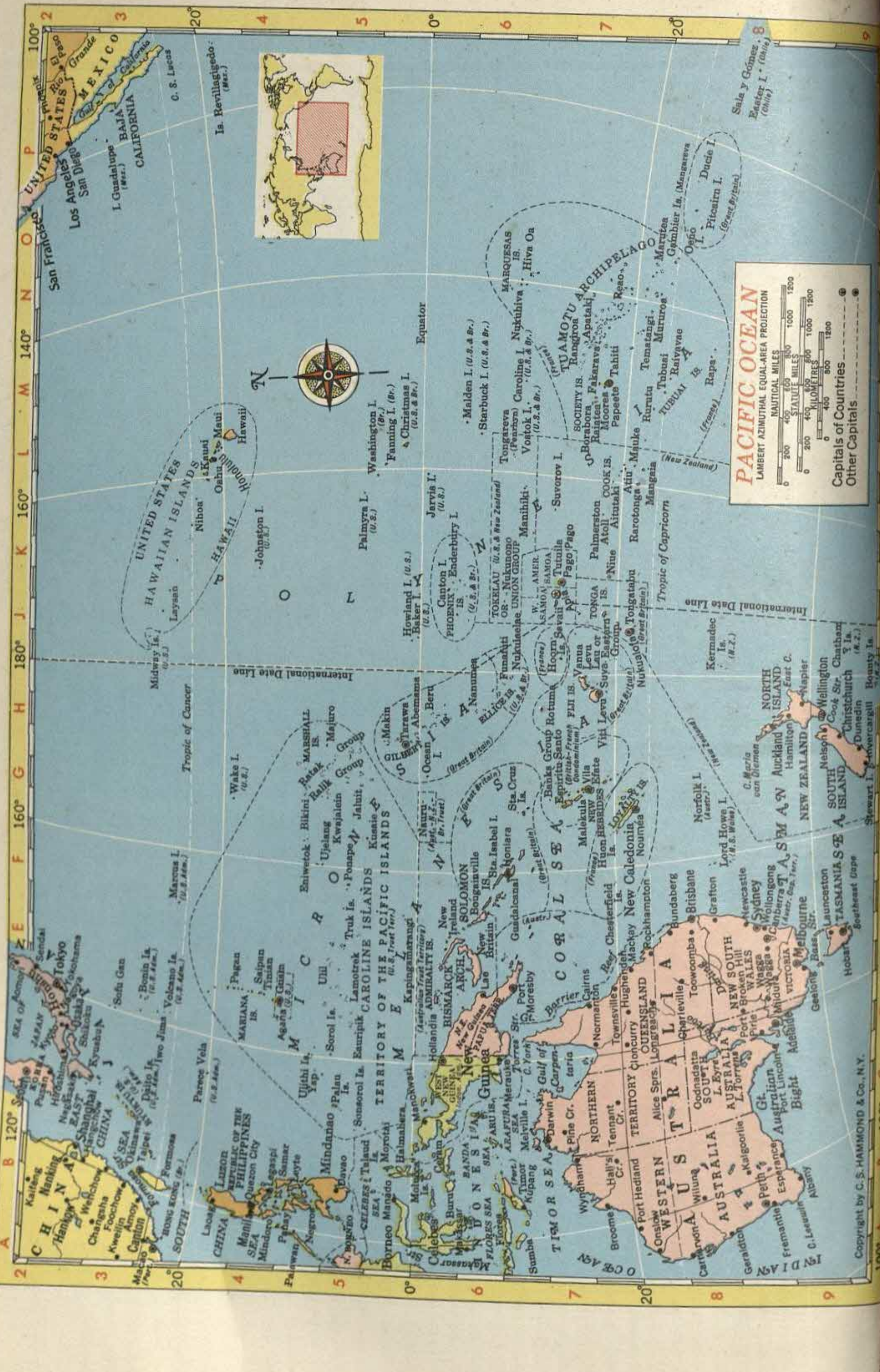
SCALE OF MILES
SCALE OF KILOMETRES
Mountain Altitudes in Feet
NEW ZEALAND
Same scale as main map.
North Island
South Island
Tasmania
New Guinea
New Caledonia
CORAL SEA
TASMAN SEA
ARAFURA SEA
TIMOR SEA
GULF OF CARPENTARIA
GREAT AUSTRALIAN BIGHT
INDIAN OCEAN
Tropic of Capricorn
Great Dividing Range
Great Sandy Desert
Gibson Desert
Great Victoria Desert
Simpson Desert
MacDonnell Ranges
Musgrave Ranges
Flinders Ranges
L. Eyre
Murray R.
Darling R.
Arnhem Land
Cape York Pen.
Metres
Feet
2438
8000
1829
6000
1219
4000
914
3000
610
2000
305
1000
152
500
Sea
Level
Depression
Depression
200
109
3000
1640
Metres
Fathoms


AUSTRALIA and NEW ZEALAND
BONNE PROJECTION
SCALE OF MILES
0 200 400 600 800
SCALE OF KILOMETRES
0 200 400 600 800
National Capitals
State and Territorial Capitals
Longitude 140° East of Greenwich 150°
NEW ZEALAND
Same scale as main map
Copyright by C. S. HAMMOND & CO., N.Y.
7590
INDONESIA
TIMOR SEA
ARAFURA SEA
CORAL SEA
TASMAN SEA
INDIAN OCEAN
PACIFIC OCEAN
SOLOMON ISLANDS (Br.)
NEW CALEDONIA (Fr.)
PAPUA
WESTERN AUSTRALIA
NORTHERN TERRITORY
SOUTH AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
VICTORIA
TASMANIA
AUSTRALIAN CAP. TERR.
Great Australian Bight
Gulf of Carpentaria
Great Barrier Reef
Great Dividing Range
Tropic of Capricorn
Torres Str.
Bass Str.
Cook Str.
Foveaux Str.
Great Sandy Desert
Gibson Desert
Great Victoria Desert
Simpson Desert
MacDonnell Ranges
Musgrave Ranges
Murchison Ra.
St. George Range
Stuart Range
Australian Alps
Southern Alps
L. Eyre
L. Torrens
L. Gairdner
L. Frome
L. Amadeus
L. Mackay
L. Disappointment
L. Carnegie
L. Carey
L. Barlee
L. Moore
L. Woods
Bulloo L.
Murray
Darling
Warrego
Cooper's Cr.
Flinders
Mitchell
Victoria
Ord
Fitzroy
Daly
Roper
Ashburton
Murchison
Fortescue
Canberra
Sydney
Melbourne
Brisbane
Adelaide
Perth
Hobart
Darwin
Wellington
Auckland
Christchurch
Dunedin
Port Moresby
Honiara
Nouméa
Dili
Java
Bali
Soemba
Soembawa
Timor
Koepang
Melville I.
Bathurst I.
Groote Eylandt
Wellesley Is.
Kangaroo I.
King I.
Furneaux Group
Flinders I.
Barrow I.
Dirk Hartog I.
Steep Pt.
Shark B.
North West C.
C. Leveque
C. Talbot
C. Arnhem
C. York
C. Flattery
C. Manifold
C. Byron
C. Howe
C. Otway
C. Naturaliste
C. Arid
C. Maria van Diemen
Wilson's Promontory
Cape York Pen.
Arnhem Land
Joseph Bonaparte Gulf
Van Diemen Gulf
Collier B.
Spencer Gulf
Gulf St. Vincent
Broome
Derby
Wyndham
Port Hedland
Roebourne
Marble Bar
Carnarvon
Geraldton
Northampton
Meekatharra
Wiluna
Leonora
Kalgoorlie
Boulder
Norseman
Esperance
Albany
Bunbury
Collie
Fremantle
Northam
Merredin
Narrogin
Northcliffe
Katherine
Pine Creek
Birdum
Newcastle Waters
Barrow Creek
Alice Springs
Oodnadatta
Coober Pedy
Marree
Port Augusta
Port Pirie
Whyalla
Port Lincoln
Fowler's Bay
Streaky Bay
Peterborough
Murray Bridge
Mount Gambier
Camooweal
Cloncurry
Boulia
Normanton
Coen
Cooktown
Cairns
Forsayth
Charters Towers
Townsville
Hughenden
Aramac
Longreach
Barcaldine
Blackall
Clermont
Emerald
Mackay
Rockhampton
Bundaberg
Maryborough
Gympie
Charleville
Roma
St. George
Toowoomba
Ipswich
Lismore
Grafton
Moree
Armidale
Tamworth
Newcastle
Wollongong
Lithgow
Blue Mts.
Orange
Dubbo
Bourke
Cobar
Broken Hill
Mildura
Wagga Wagga
Albury
Cootamundra
Bendigo
Ballarat
Geelong
Castlemaine
Horsham
Warrnambool
Wonthaggi
Bairnsdale
Launceston
Devonport
Queenstown
Whangarei
Hamilton
Bay of Plenty
Gisborne
Napier
Hastings
Palmerston North
Wanganui
New Plymouth
Tasman Bay
Nelson
Greymouth
Timaru
Oamaru
Invercargill
Stewart I.
North Island
South Island
Guadalcanal
The Great Barrier
Austin Goldfield
Goldfield
Kimberley Goldfield
10° 20° 30° 40°
110° 120° 130° 140° 150° 160° 170° 180°
A B C D E F
1 2 3 4 5



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